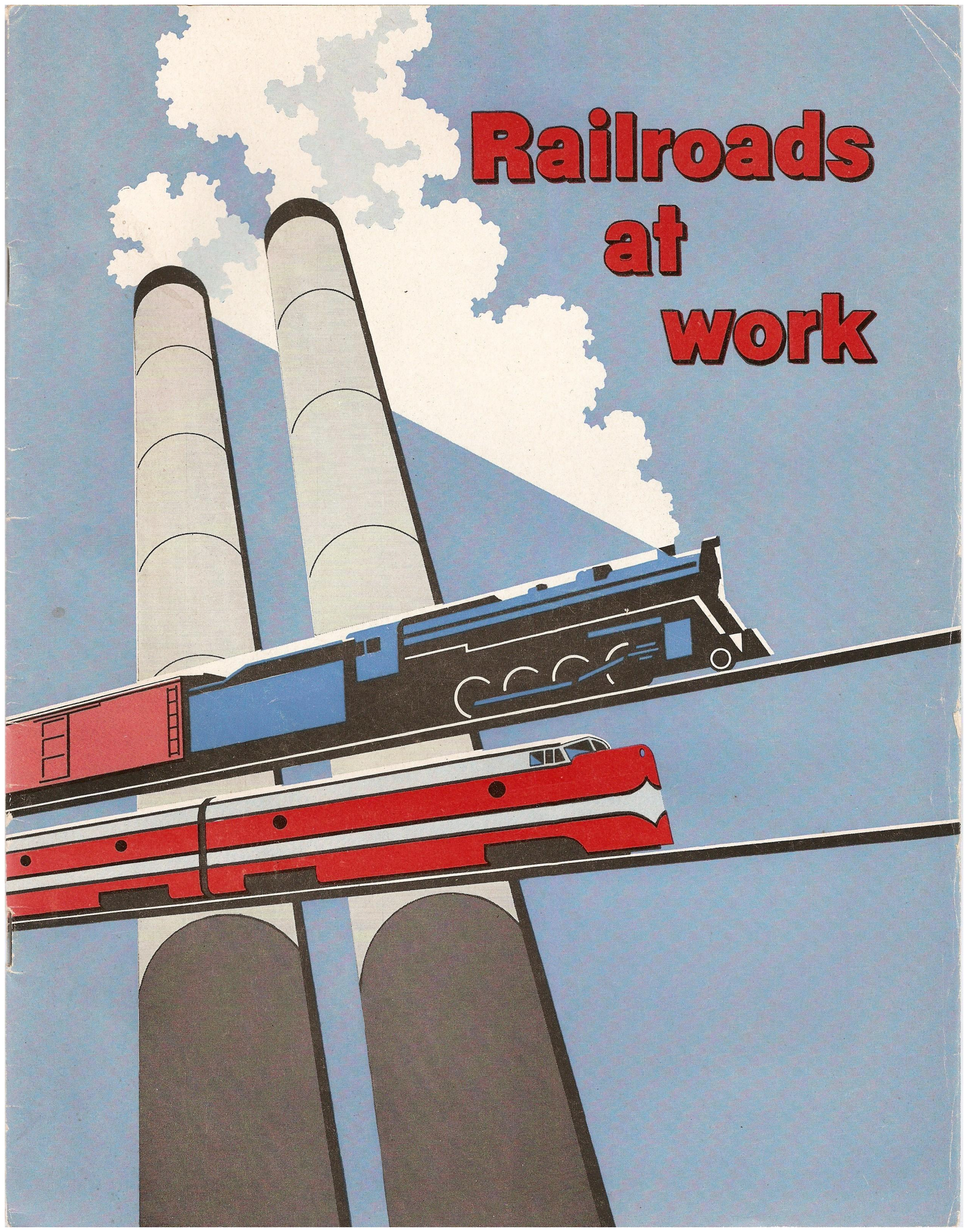


Railroads at work





THIS BOOK BELONGS TO

NAME

SCHOOL

HOME
ADDRESS

RAILROADS AT WORK

A Picture Book
of the American Railroads
in Action

SIXTH EDITION

TO TEACHERS

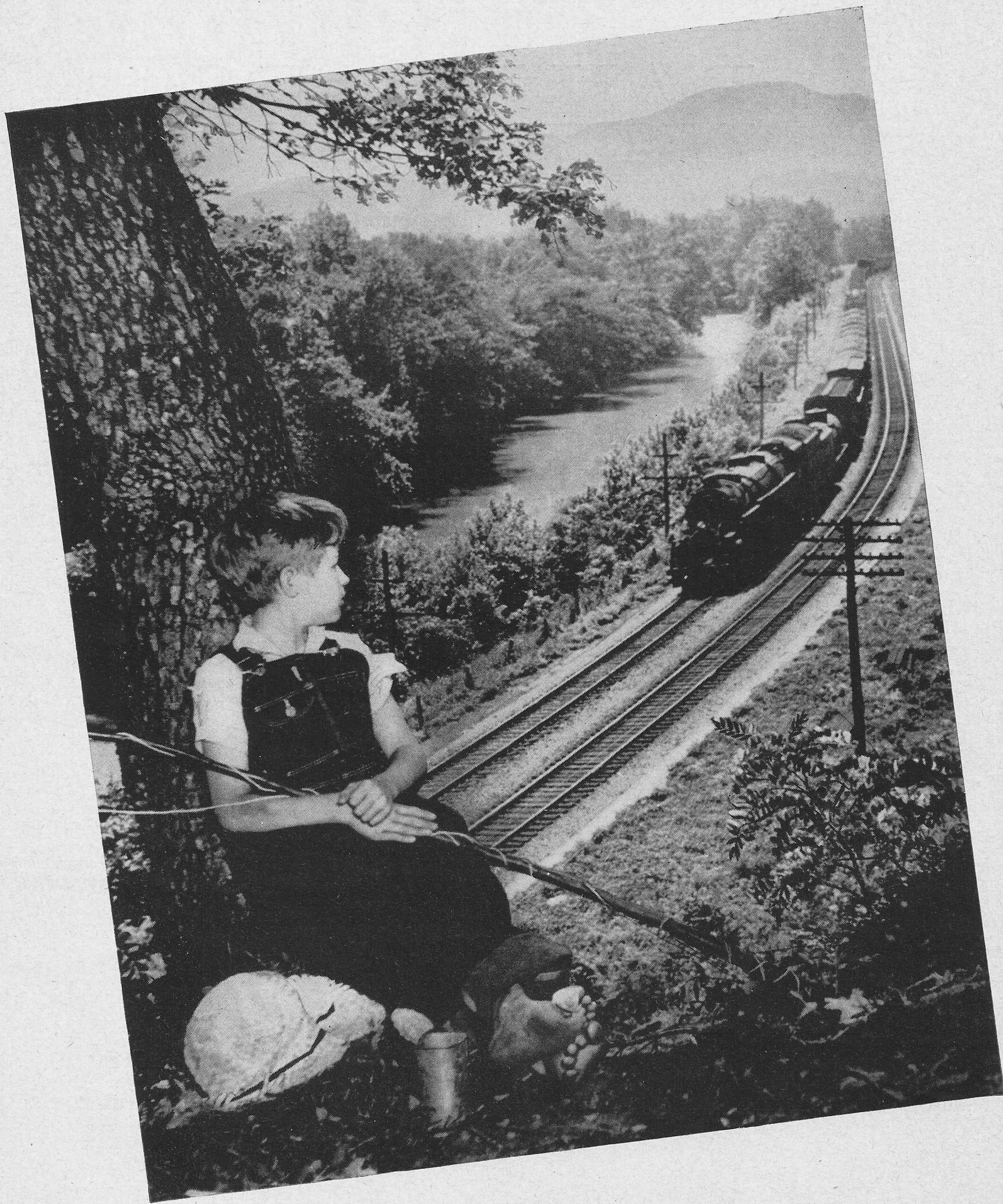
This booklet is designed for the use of pupils engaged in a study of transportation, and may be obtained in quantity for that purpose. It is keyed to the *Teacher's Kit for a Study of Railroad Transportation* which is available *only to teachers*.

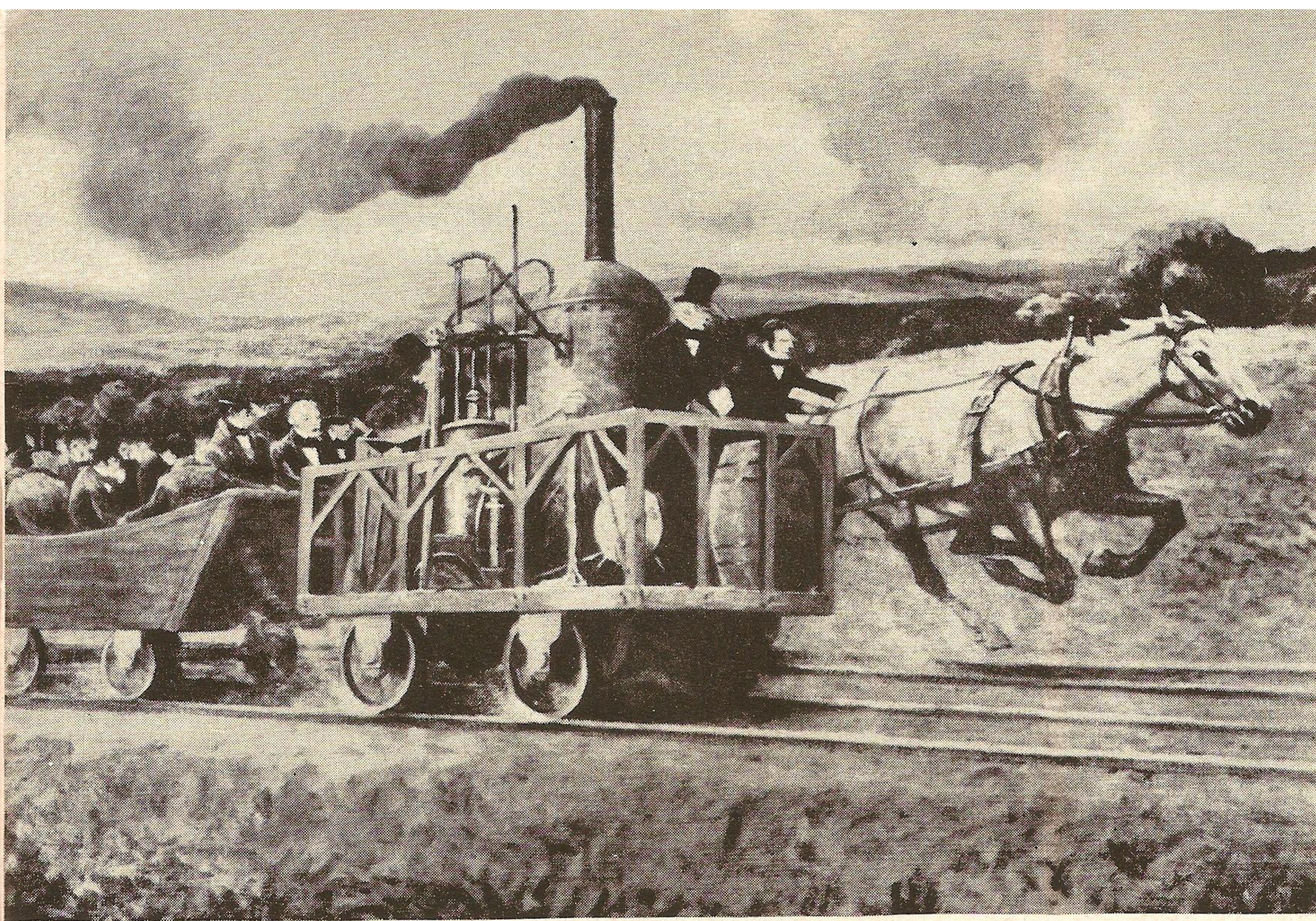
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ASSOCIATION OF AMERICAN RAILROADS

TRANSPORTATION BUILDING • WASHINGTON 6, D. C. • 1954

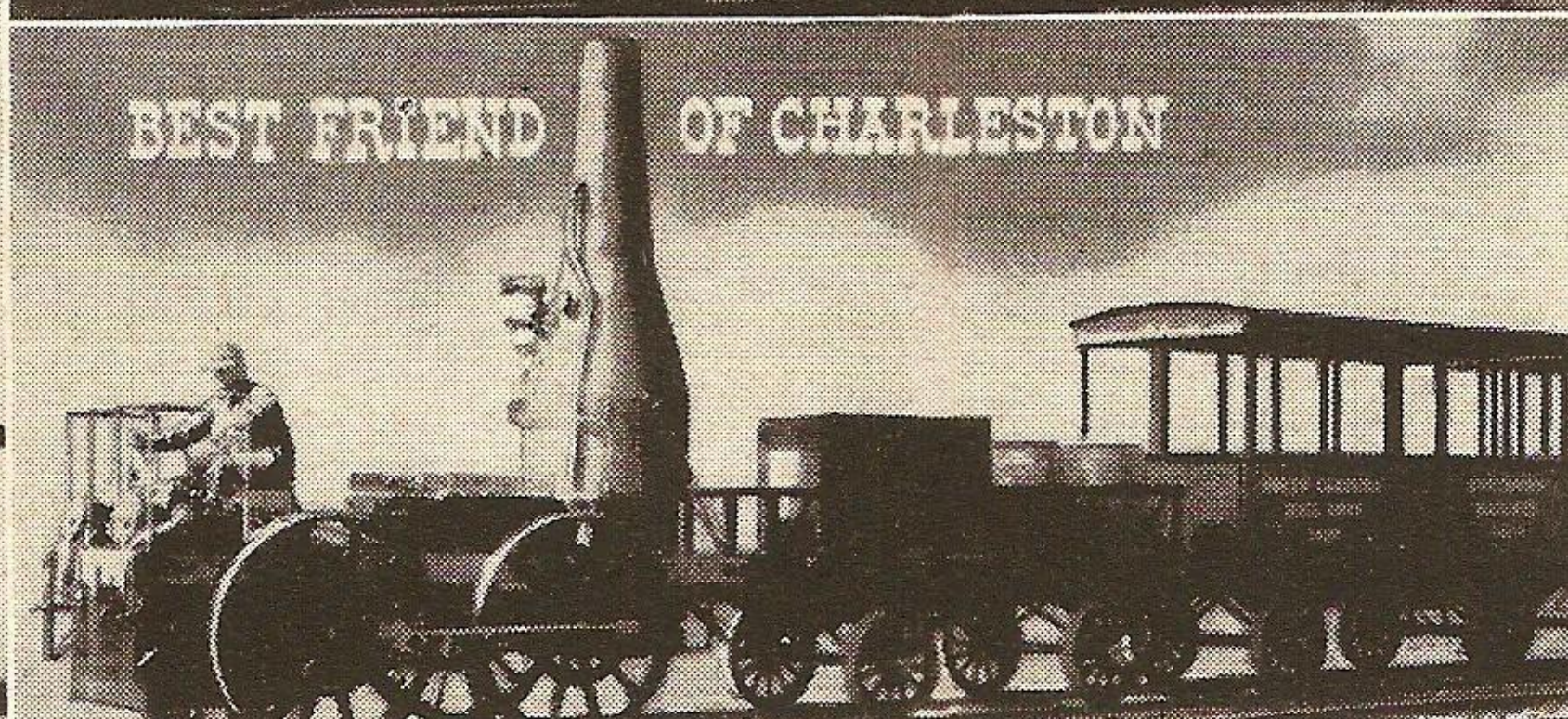
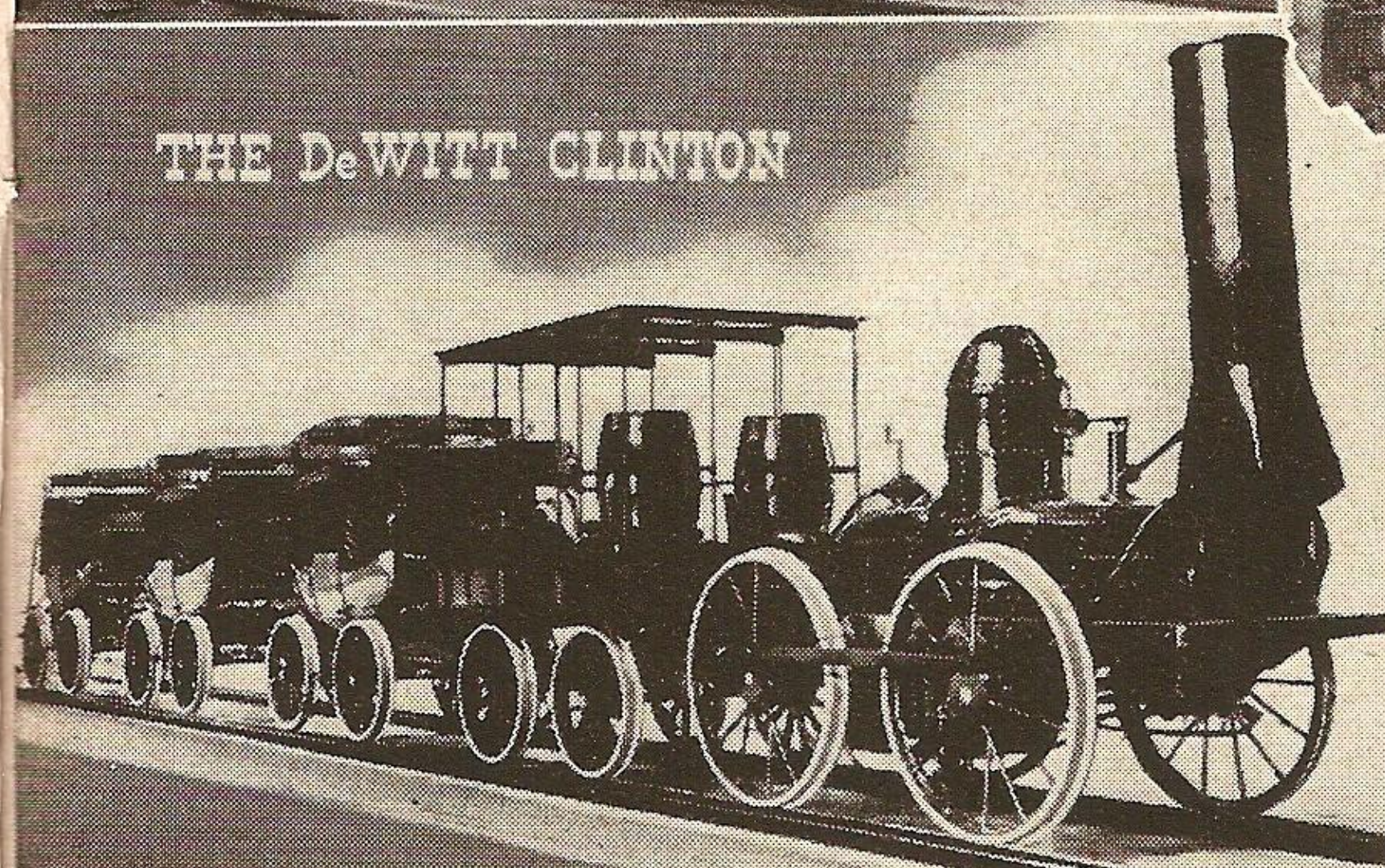
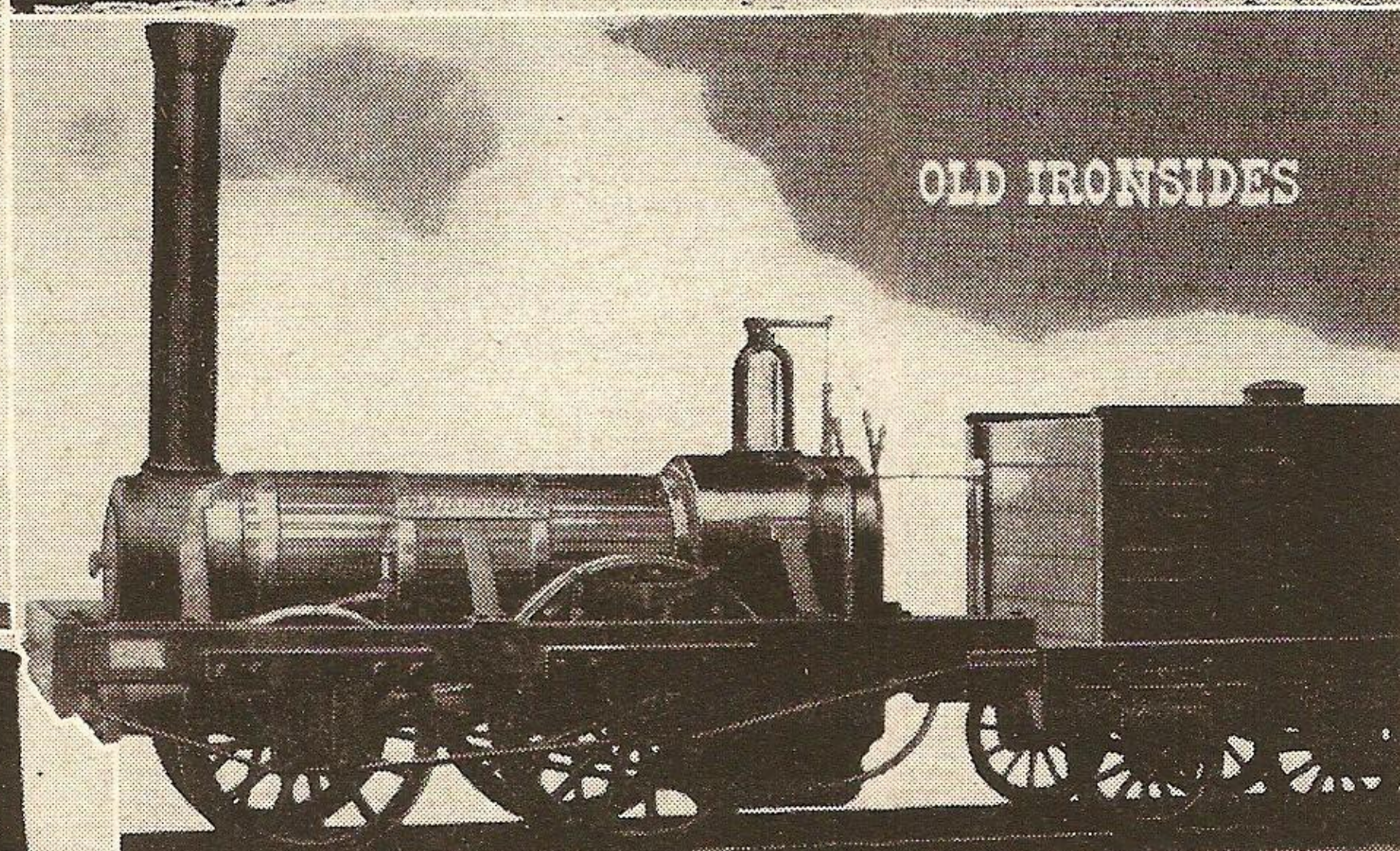
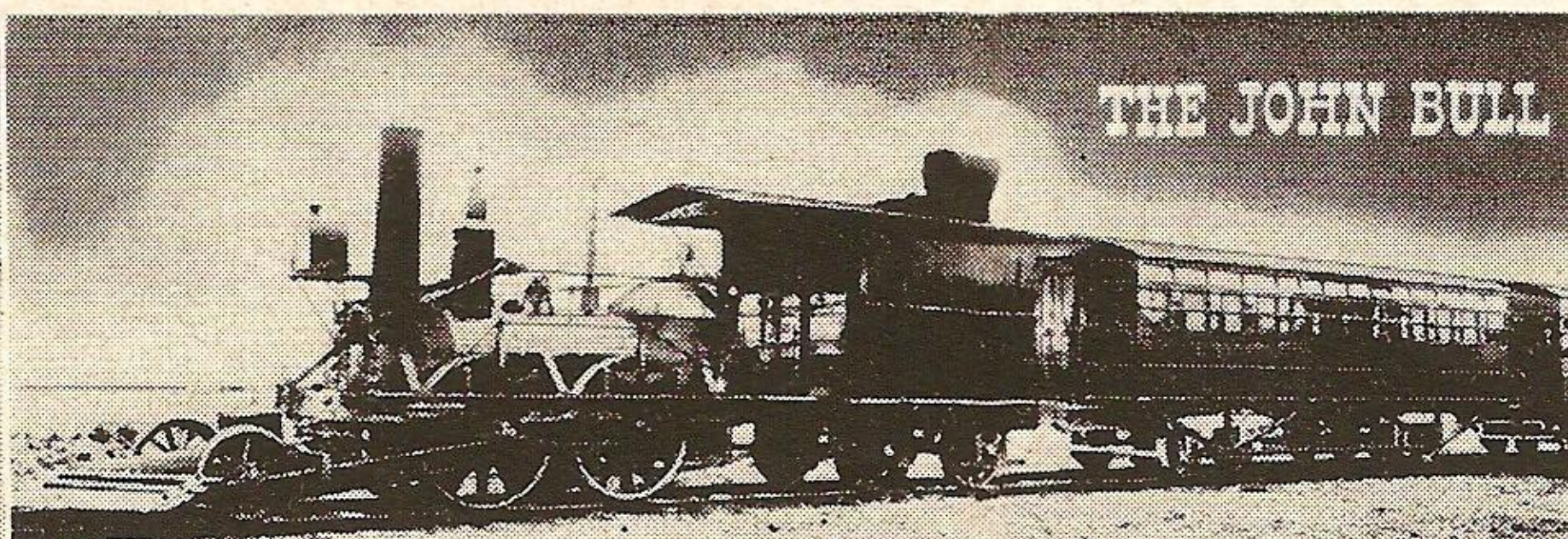




RACE OF IRON HORSE AND HORSE CAR

1 Many years ago men found a way to make steam run a machine. This machine was called a steam engine. Years later in England, George Stephenson and other inventors put a steam engine on wheels and made it run over a road of rails. This traveling steam engine was called an "Iron Horse."

In 1829, Peter Cooper, American inventor, built an Iron Horse. It was so small that he called it *Tom Thumb*. It was the first Iron Horse in America to haul passengers. On a trial trip near Baltimore, the Iron Horse and a real horse tried to see which could go the faster. For a while the Iron Horse was ahead. Then it broke down, and the real horse won the race!



2 As years went by, other and better Iron Horses were built and many roads of rails were built for them to run upon. Some people called the engines "Puffing Billies." But the name which finally came to be used was LOCOMOTIVES.

This picture shows five famous locomotives of the days when railroads were young. They are: *Stourbridge Lion*, first British locomotive tried out in America; *DeWitt Clinton*, first to pull a train in New York State; *John Bull*, first to pull a train in New Jersey; *Old Ironsides*, first in Philadelphia; and, *Best Friend of Charleston*, first locomotive to pull a train of cars and the first locomotive to be placed in regular service in America.

"PUFFING BILLIES"



RAILWAY STATION AND TRAIN IN THE 1860's

3 This is a typical railway station and train about the time Abraham Lincoln became President. Locomotives were then larger and stronger than the first Iron Horses, but they would look small indeed beside today's big engines. In the picture, we also see an ox cart, drayman's wagon, carriage, cab, and stagecoach—all in common use in Lincoln's time.

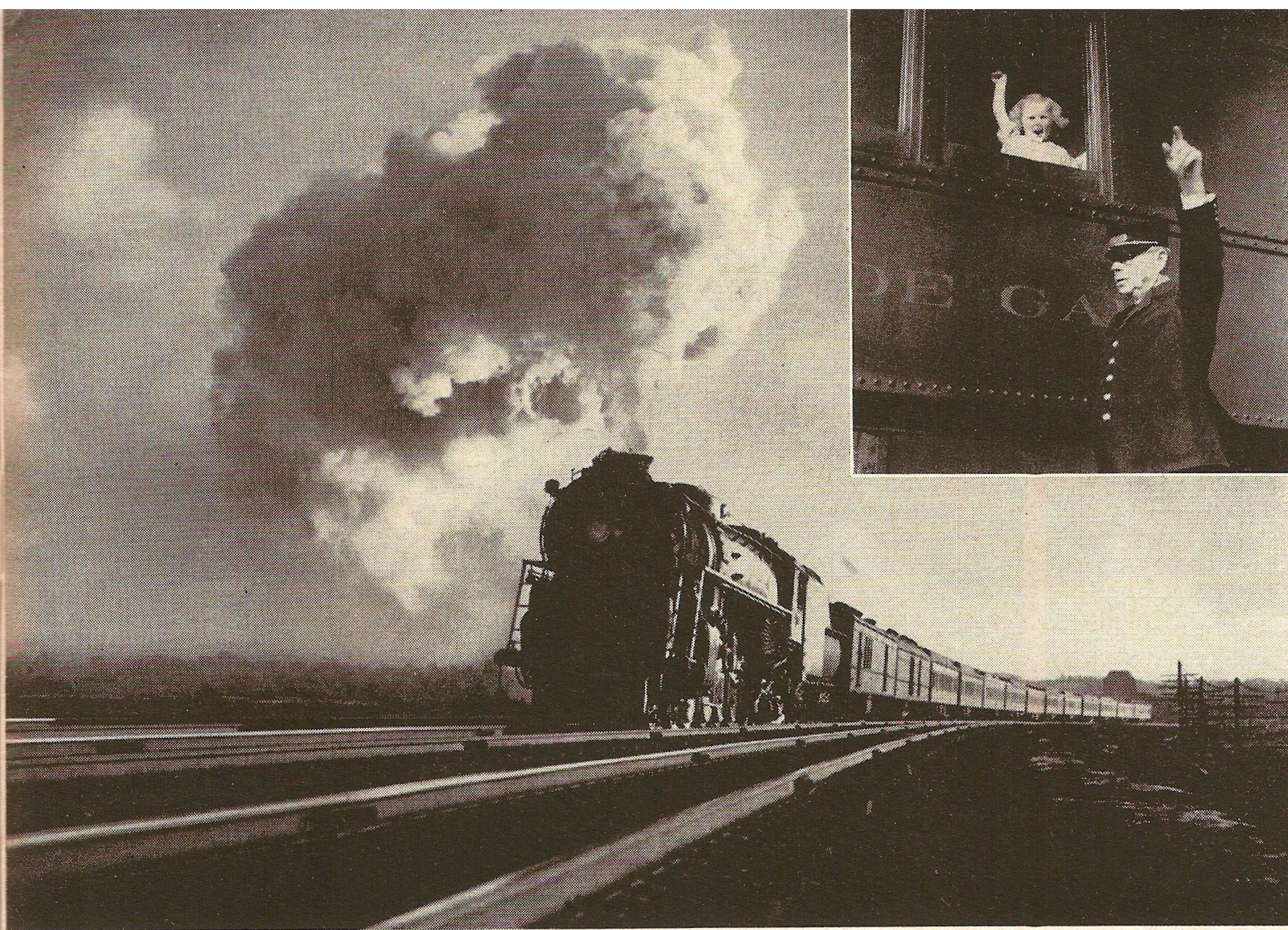
Many railroads were then being built. They opened new regions. Settlers flocked in. Farms and factories were started. Mines were opened. Villages grew up around railway stations. Many of them became important towns and cities. Schools and colleges were founded. Churches were built. America was fast becoming a great nation.

4 One of the great events in American history was the completion of the first chain of railroads to the Pacific Coast. This picture was taken in 1869, a few minutes after the Golden Spike was driven at Promontory, in the mountains of northern Utah. A locomotive from Sacramento and a locomotive from Omaha touched "noses" to symbolize the new bond between East and West. The event was celebrated from coast to coast.

Railway transportation brought the Atlantic and Pacific regions within a few days' travel of each other. Since then the time has been shortened to less than three days.

THE GOLDEN SPIKE CEREMONY





STEAM PASSENGER TRAIN

5 This is one of the many thousands of passenger trains that start on their runs in the United States each day. Steam, electric, and, more and more, Diesel-electric engines are used.

Today's railroads and trains differ in many ways from those of long ago. Tracks are stronger, heavier, and smoother. Locomotives are larger and more powerful. Then, most passenger cars were built of wood. Today, most passenger cars are built of metal. Then, cars were lighted by gas or kerosene. Today, cars are lighted by electricity. They are also air-conditioned, with temperature and ventilation controlled at all seasons.

ELECTRIC PASSENGER TRAIN



6 This passenger train is pulled by an electric locomotive. On the roof of the locomotive are two steel frames, called pantographs. One pantograph is folded. The one at the far end is opened. The top part touches the overhead wires which are charged with electricity. The locomotive draws electricity from the wires.

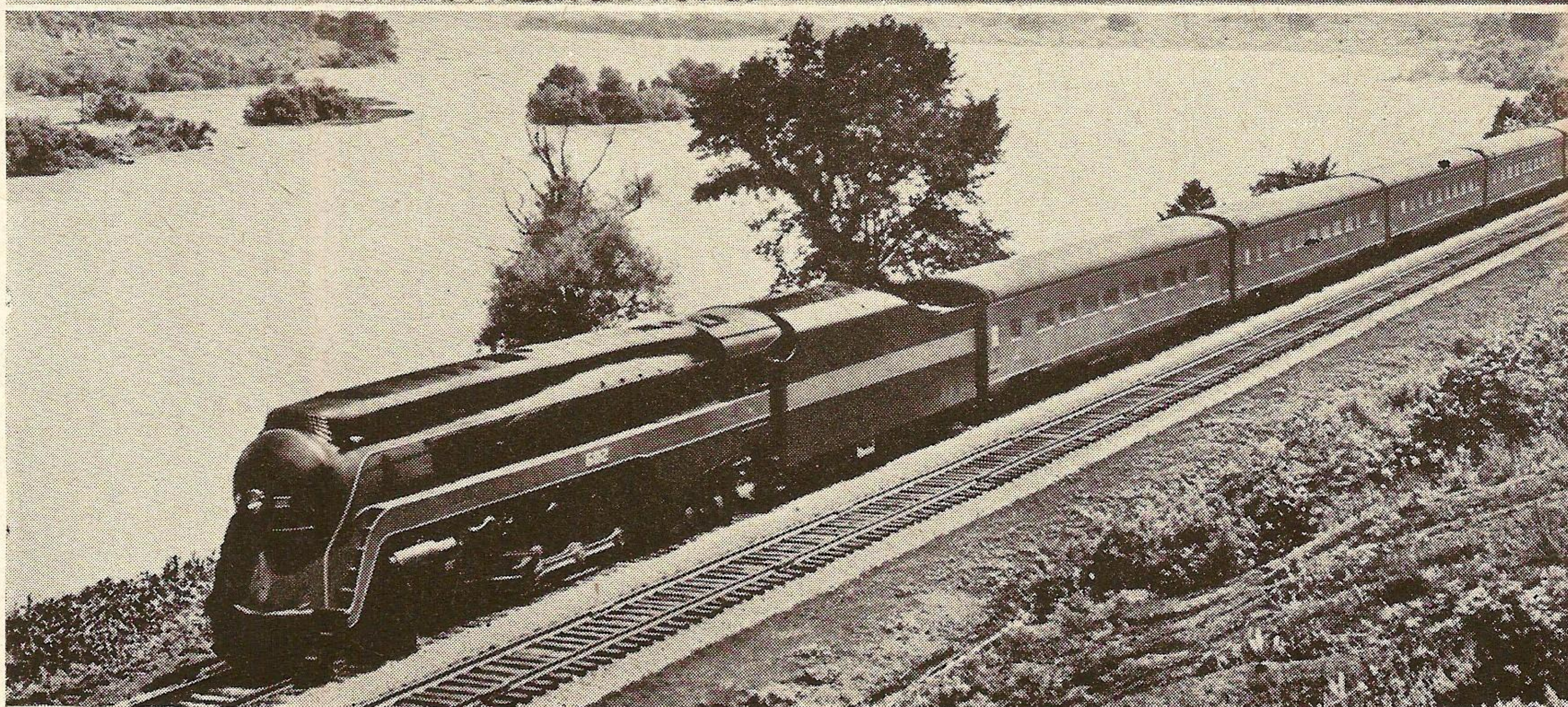
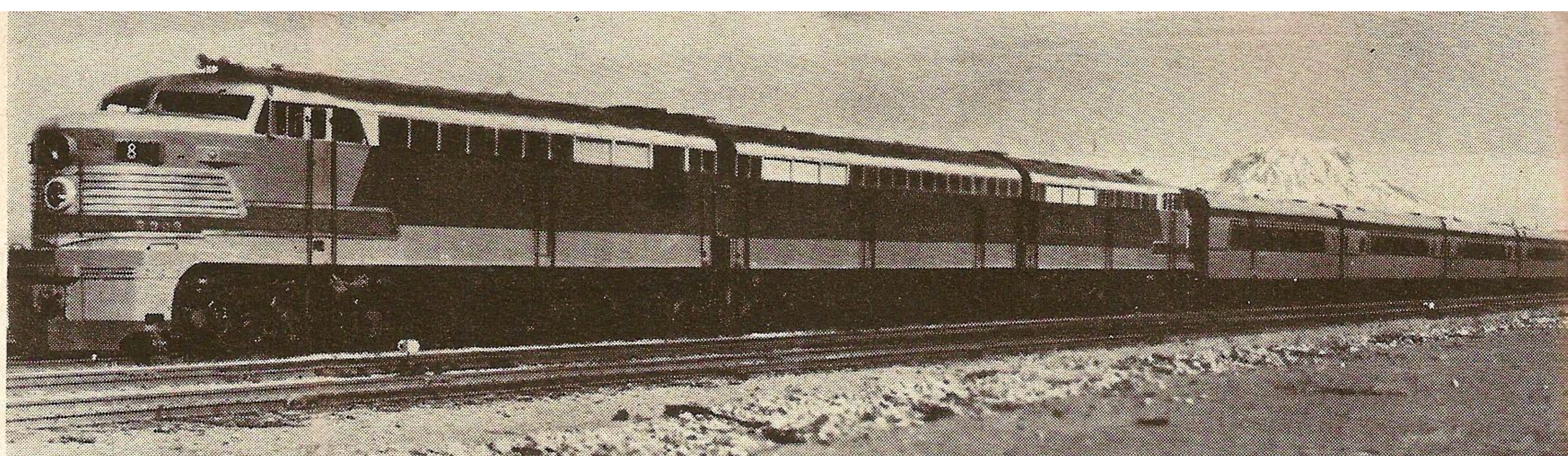
Electric locomotives carry no coal and very little water. Thus, they do not need tenders. They can go forward or backward with equal ease. They do not have to be turned around.

7 The modern trend in passenger service is the fast streamlined train. This type of train is usually built of strong but lightweight metals, and it weighs less than a standard passenger train.

Some are pulled by steam locomotives, as shown in the bottom picture. Most streamlined trains are pulled by Diesel locomotives, as shown in the top picture.

The Diesel locomotive has an oil-burning engine and a generator which supplies electric current to drive the locomotive.

Streamlined trains are air-conditioned. Sealed windows shut out dust, smoke, cinders, and drafts and reduce outside train noises.



STREAMLINED PASSENGER TRAINS

PASSENGER STATION IN A BIG CITY

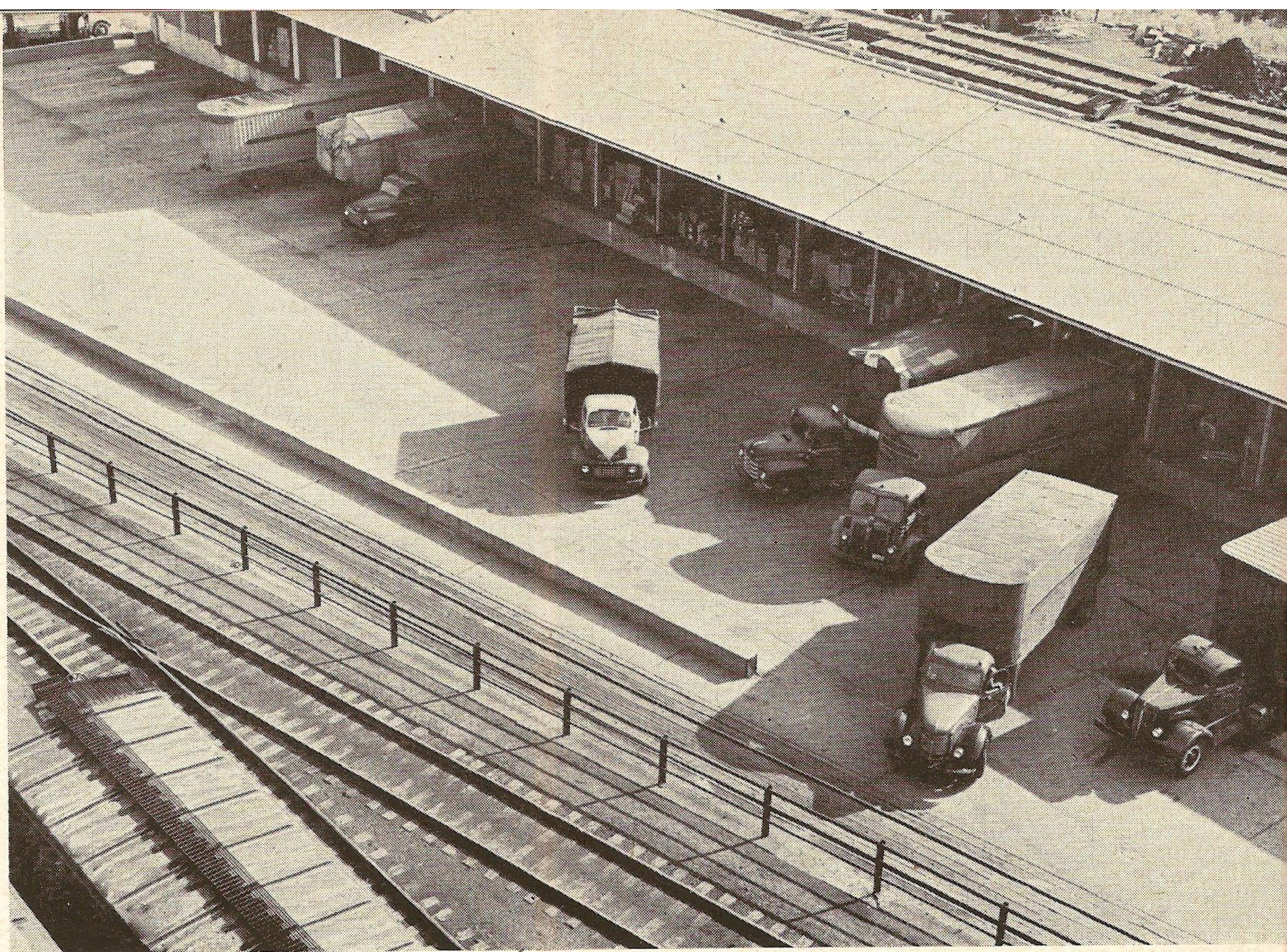


8 Nearly every town and city has a railway passenger station. The size of a station usually depends upon the number of passengers handled. At the station, we buy tickets for our trip, check our baggage, and board our train. Sometimes we go to the station to meet friends who are arriving by train or to bid good-bye to friends who are going away.

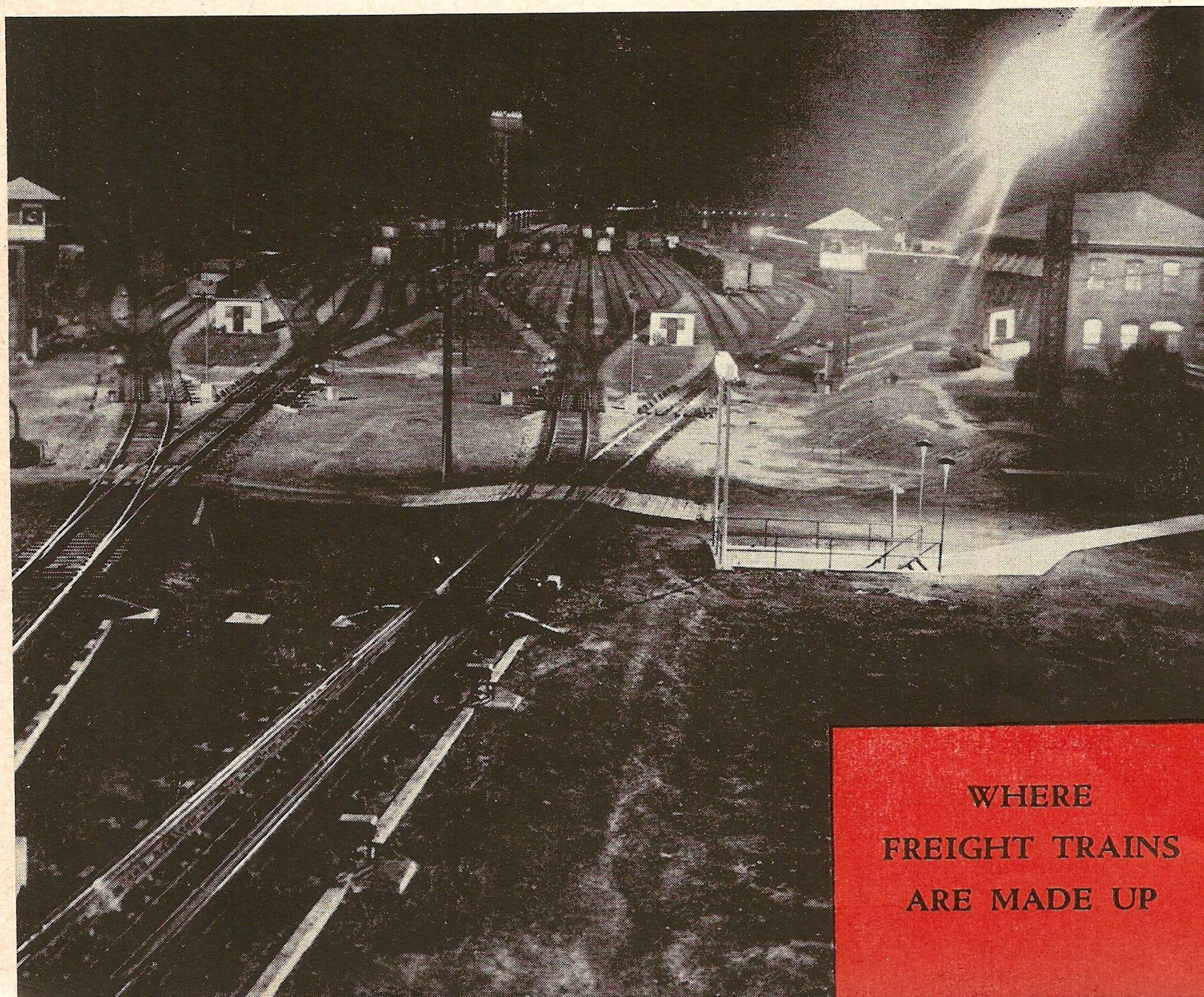
In a large railway station, like the one in the picture, there are ticket offices, information booths, waiting rooms, baggage rooms, lost-and-found offices, parcel check rooms, lockers, telegraph offices, telephone booths, restaurants, news

39 When a local merchant wants to send freight by railroad, he delivers it to the freight station. If a package for the merchant is received at the station, a notice is sent to him and he sends for it.

In addition to the freight which is brought to the freight station by shippers or carried away from it by receivers, the railroads also pick up and deliver shipments—in the same way that the Railway Express Agency collects and delivers express packages. Such railroads have their own or hired motor trucks to maintain this service to the doors of factories, stores, and other places of business.



PICK-UP AND DELIVERY SERVICE



WHERE
FREIGHT TRAINS
ARE MADE UP

40 The freight yard is a busy place. Here, cars are sorted and made up into trains. A freight train starts its run from one freight yard and completes its run in another yard many miles away.

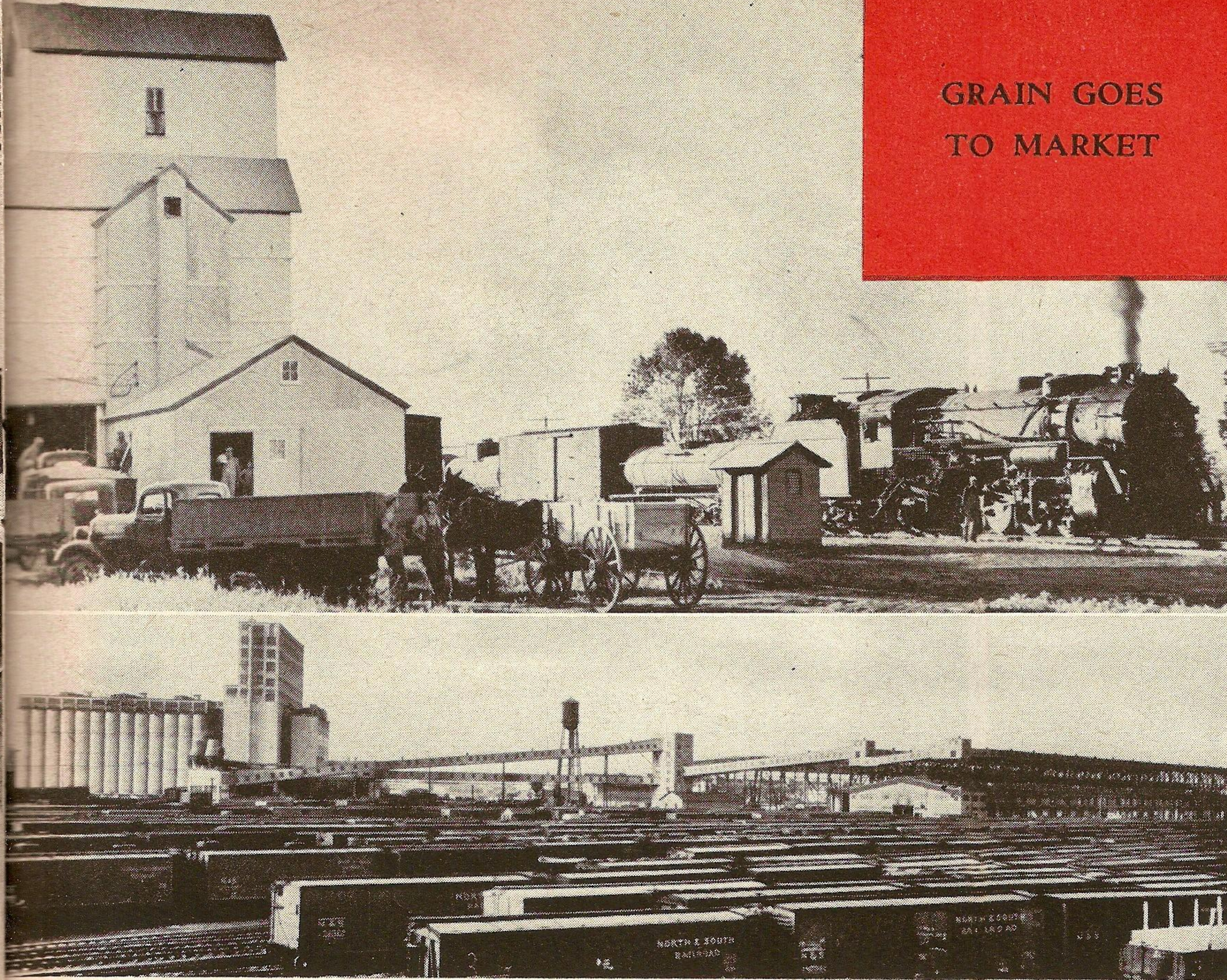
In some large freight yards, cars are run over the "hump" and put together in trains. The "hump" is a track that passes over a slight elevation of ground, forming an incline. When a car is "cut" from the train on the hump it runs down hill by gravity. A man in a tower sets switches so that the car goes to the track where it is wanted. To slow down or stop the car he pushes a button which causes "car retarders" in the track to press against the sides of the moving car wheels.

GRAIN GOES TO MARKET

41 Nearly all towns in the grain-producing areas have tall grain elevators. These country elevators are located on the railroad so that grain can be loaded directly into freight cars. Farmers bring wheat and other grains to the country elevator. The grain is lifted into bins by conveyors. From the bins it is poured or blown into freight cars through large tubes.

Freight cars take the grain to terminal elevators in the city. There it is cleaned, dried, and graded. Then it is again loaded into freight cars and taken to a mill to be made into flour, cereals, or other grain products.

The principal flour-milling states are Kansas, New York, Minnesota, Missouri, Illinois, and Texas.



42 Refrigerator cars serve the same purpose as refrigerators in our homes. They keep fresh fruits, vegetables, dairy products, meats, fish, and other foods cold, so they will not spoil on the way to market.

The men in the picture are putting ice into refrigerator cars. A moving chain belt brings cakes of ice to the icing platform. The men then drop them through trap doors, called hatches, into bins or bunkers. The floor and walls of the car are insulated so that when the doors and hatches of the car are closed, the ice will keep the interior of the car cold.

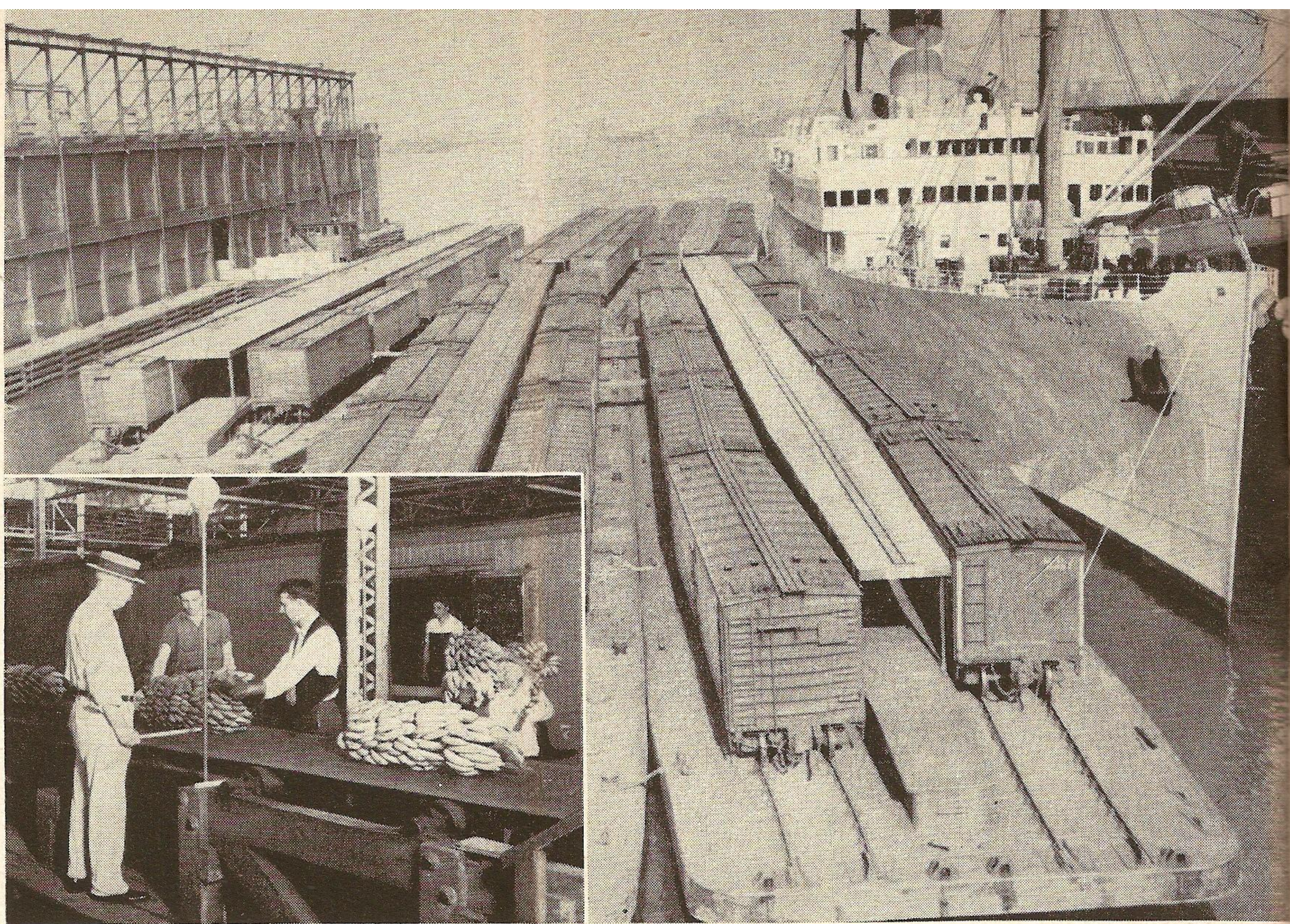
In cold weather, refrigerator cars are used without ice to carry some perishables which might freeze in ordinary box cars.

ICING THE REFRIGERATOR CARS



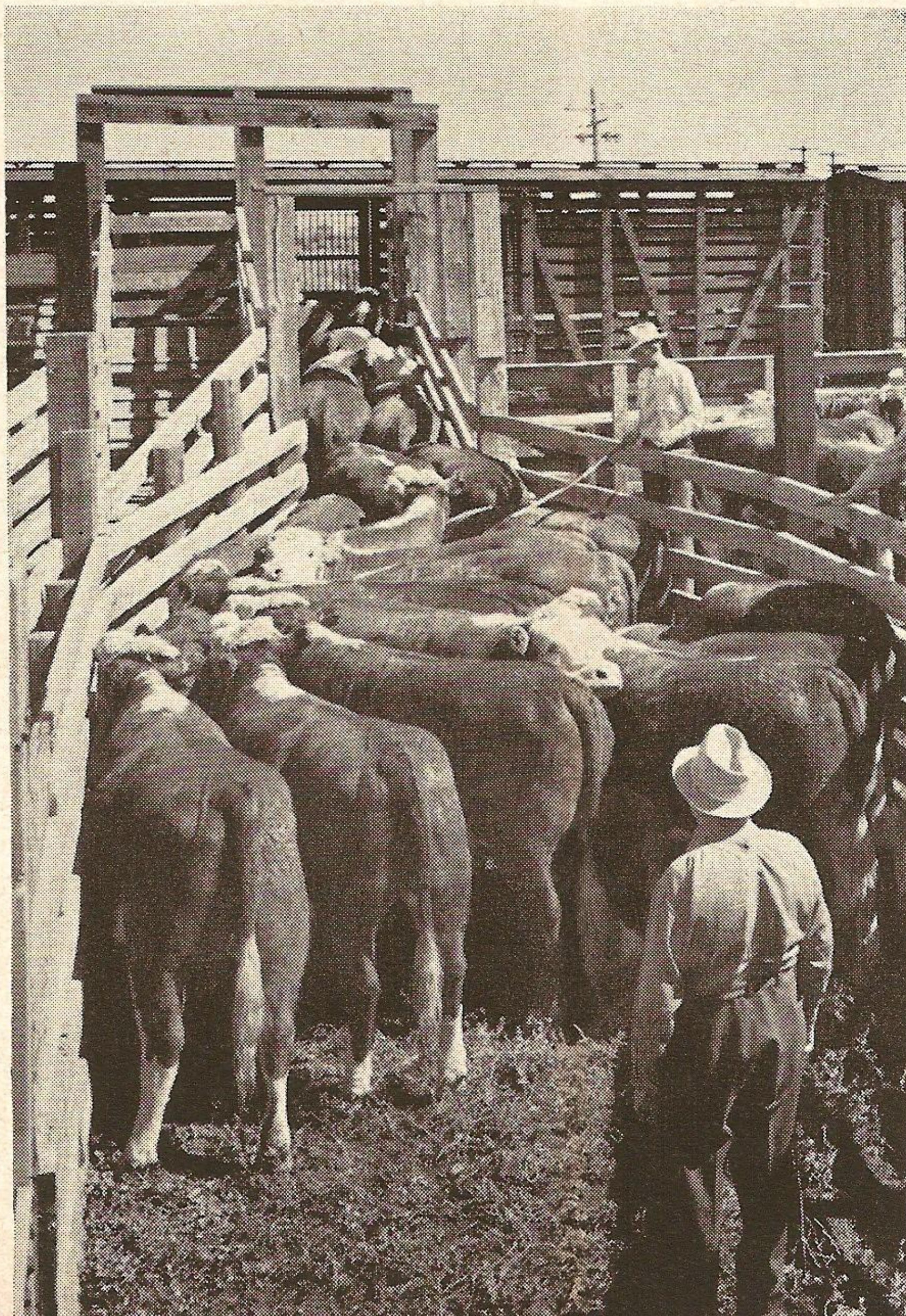
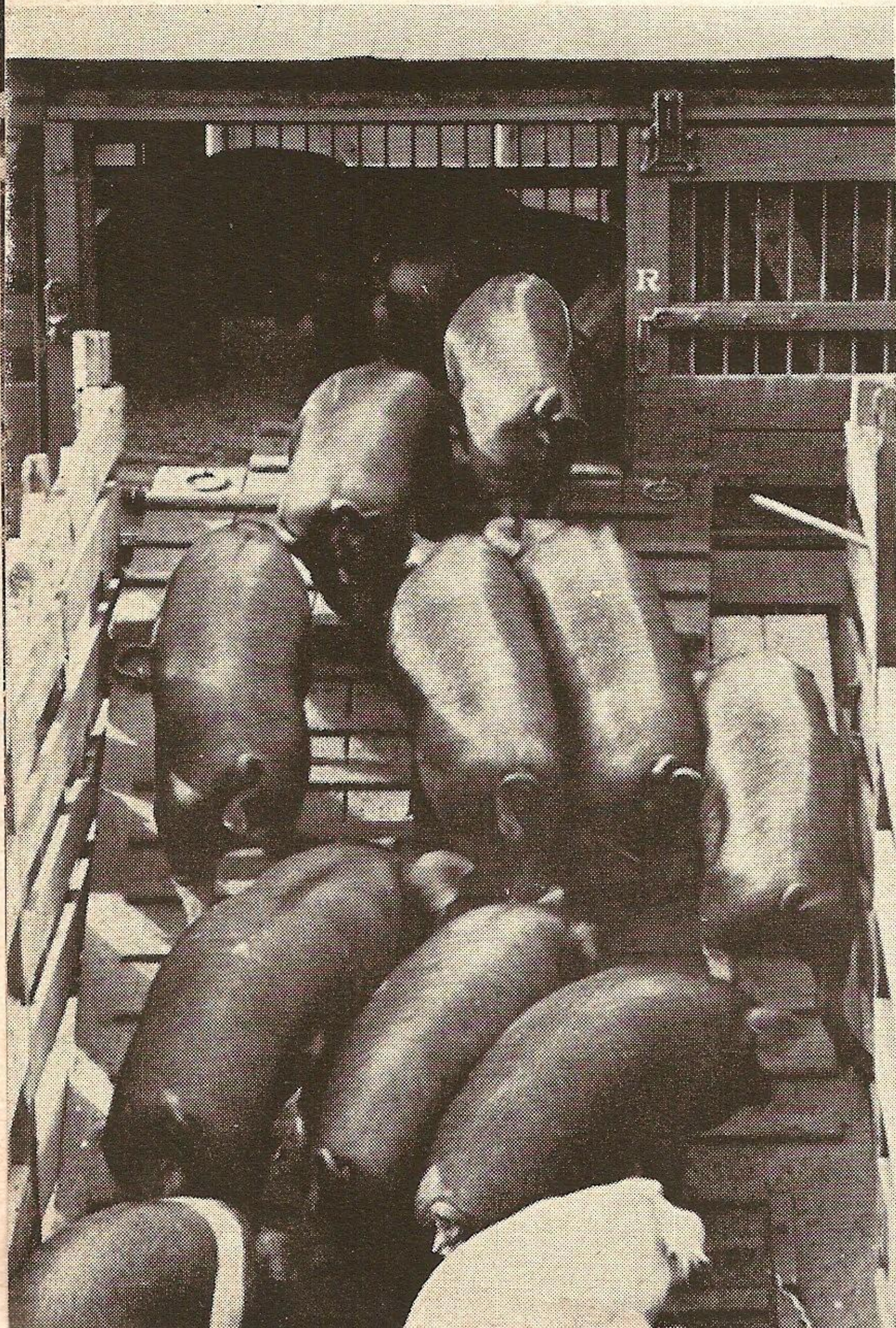
43 Bananas travel thousands of miles to reach our tables. Most of the bananas we eat grow in Central America, South America, and the West Indies. They are shipped over little railroads to the seaports; by steamships to our ports; then by railroads to cities and towns all over the United States.

Sometimes bananas are unloaded from a steamship to refrigerator cars on large car floats, or "lighters," as seen in the larger picture. The floats are then towed to a dock, their tracks are connected with railroad tracks and the cars are hauled away to a freight yard where a banana train is "made up." Sometimes one ship will bring enough bananas to fill two or more trains.



BANANAS COME BY SHIP AND RAIL

LIVESTOCK ON THE WAY TO MARKET



44 Our railroads carry cattle, calves, hogs, sheep, and lambs from the farms to the stockyards in the cities. Cars used for this purpose are like box cars except that the side walls are made of slats set two or three inches apart to give the animals plenty of fresh air. Many cars that carry hogs and sheep have two decks.

Animals and poultry on their way to market are fed, watered, and looked after by caretakers who travel on the train. On long journeys, the animals are removed from the train somewhere along the way and kept for several hours in "resting pens."

45 Fresh meats are chilled or frozen in meat packing plants and wrapped before being loaded into cars with controlled temperatures. In the picture, men are unloading sides of beef from refrigerator cars. These cars are equipped with steel bars upon which to hang the meat. Often poultry, dairy, and other food products are loaded and shipped in the same car with fresh meats.

Before there were refrigerator cars, fresh meats could not be shipped long distances without spoiling. Today, railroads bring us perishable products no matter how far we may live from the places where they are produced.



UNLOADING FRESH MEATS

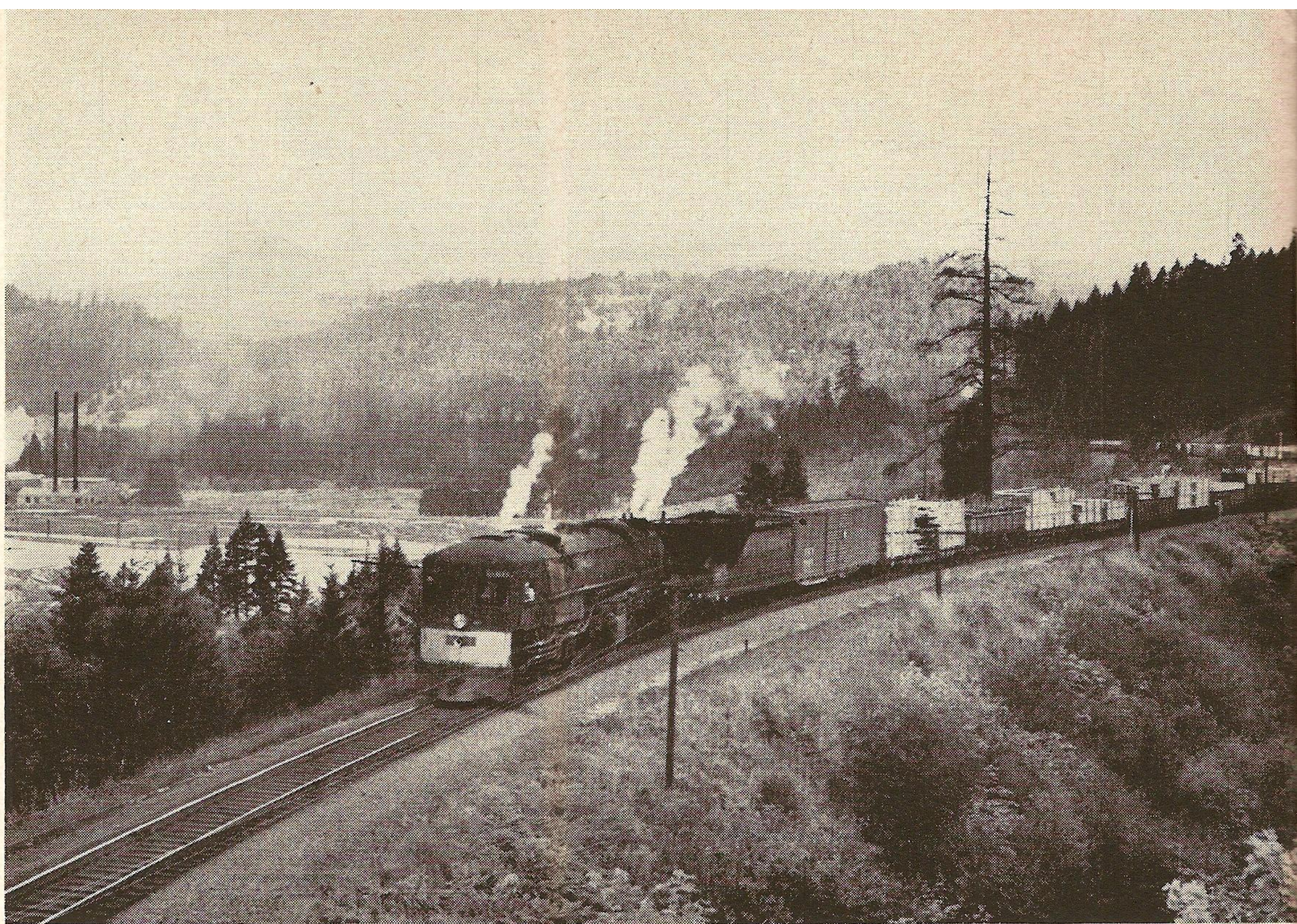
46 Millions of Americans depend upon the railroads to bring their daily supply of fresh milk and cream. In many instances, milk and cream are carried hundreds of miles to market, requiring the utmost care from the time they leave the farms until they reach our tables. Milk must be kept perfectly clean. It must be kept cold, but not too cold. Some milk is transported in insulated glass-lined steel tank cars; some is shipped in large cans like the ones in the picture. Cars are sometimes fitted with shelves so that the cans can be loaded in tiers.

BRINGING MILK TO THE CITY



47 The forest industry is a large user of transportation. After trees are felled and trimmed in the forest, they are taken to the mills. Then the lumber and products of the mills must be taken to the places where they are needed. Railroads take things from where they are produced and deliver them to places where they are needed.

Railroads themselves are large buyers and users of forest products. They buy crossties, telephone and telegraph poles, bridge timbers, piling, fence posts, and lumber for buildings, platforms, docks and wharves, box cars, and other uses.

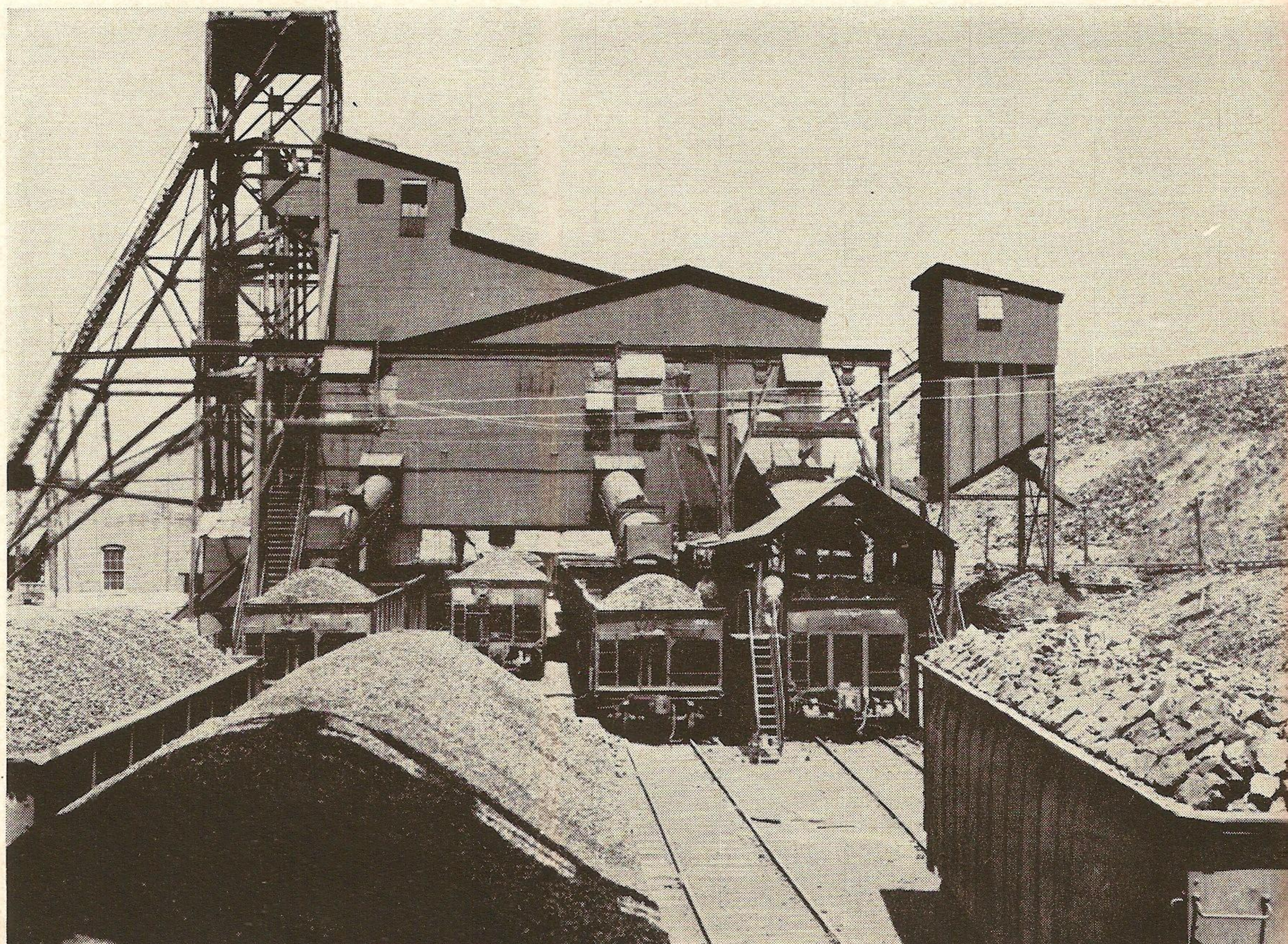


FOREST PRODUCTS MOVE BY RAIL

48 Coal mines and railroads work together. Coal mines help the railroads by supplying them with fuel for their locomotives, shops, stations, and offices, and by furnishing coal to haul. Railroads help the coal mines by bringing them machinery, tools and other supplies, by purchasing large quantities of coal for railroad uses, and by hauling coal to places where needed.

In this picture, several sizes of coal are being loaded into freight cars at the mine. Both hopper cars and gondola cars carry coal. Railroads take the coal to factories and mills, railroad coaling stations, coal yards in cities and towns, and to seaports and lake ports.

LOADING COAL CARS AT THE MINE

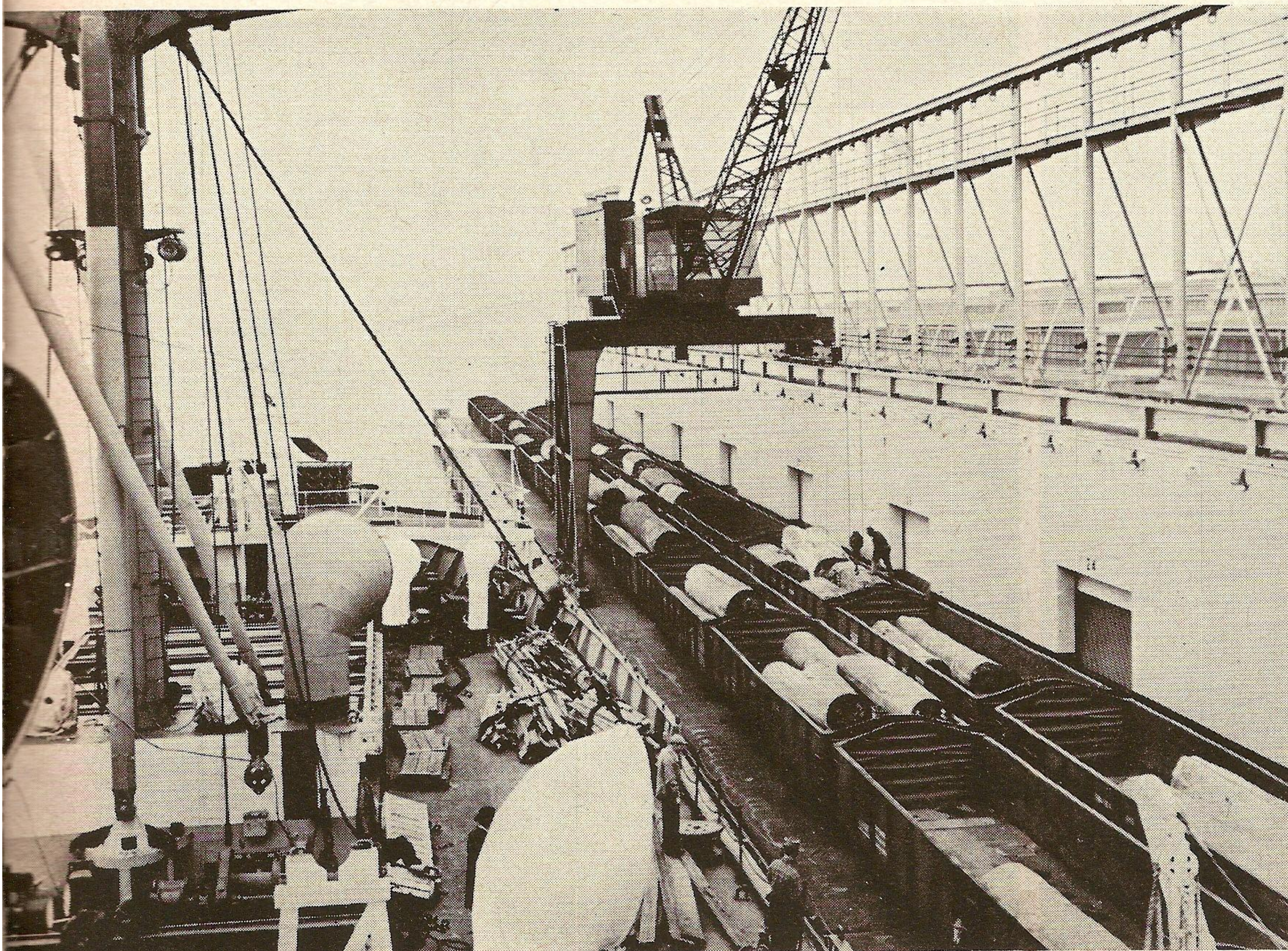




DUMPING COAL FROM CARS INTO SHIPS

49 Many years ago a large crew of men toiled for days to take coal or ore from cars and load it into a ship. The modern way is to use dumping machines like the one in the picture. This machine grips a loaded coal car firmly, lifts it 50 or 75 feet above the track, and then turns it over, dumping the coal into a "pan" attached to a chute leading to the ship's hold. The empty car is then returned to the track, and as soon as it is pushed out of the way, another loaded car is brought into position for dumping. The astonishing thing is that all of this takes only about a minute.

RAILROADS SERVE THE SEAPORTS



50 The United States trades with nations all over the world. Thousands of ships are employed to carry the products of our farms, forests, mines, and factories to other lands and to bring the many things we need from other lands. Many trainloads of freight arrive and depart at our seaports each day.

This picture shows mahogany logs being unloaded from ships into gondola cars on a railroad dock. The dock is where freight is transferred from ship to car or from car to ship. At every seaport the railroads have freight yards and warehouses. Many railroads have their own docks and other buildings.

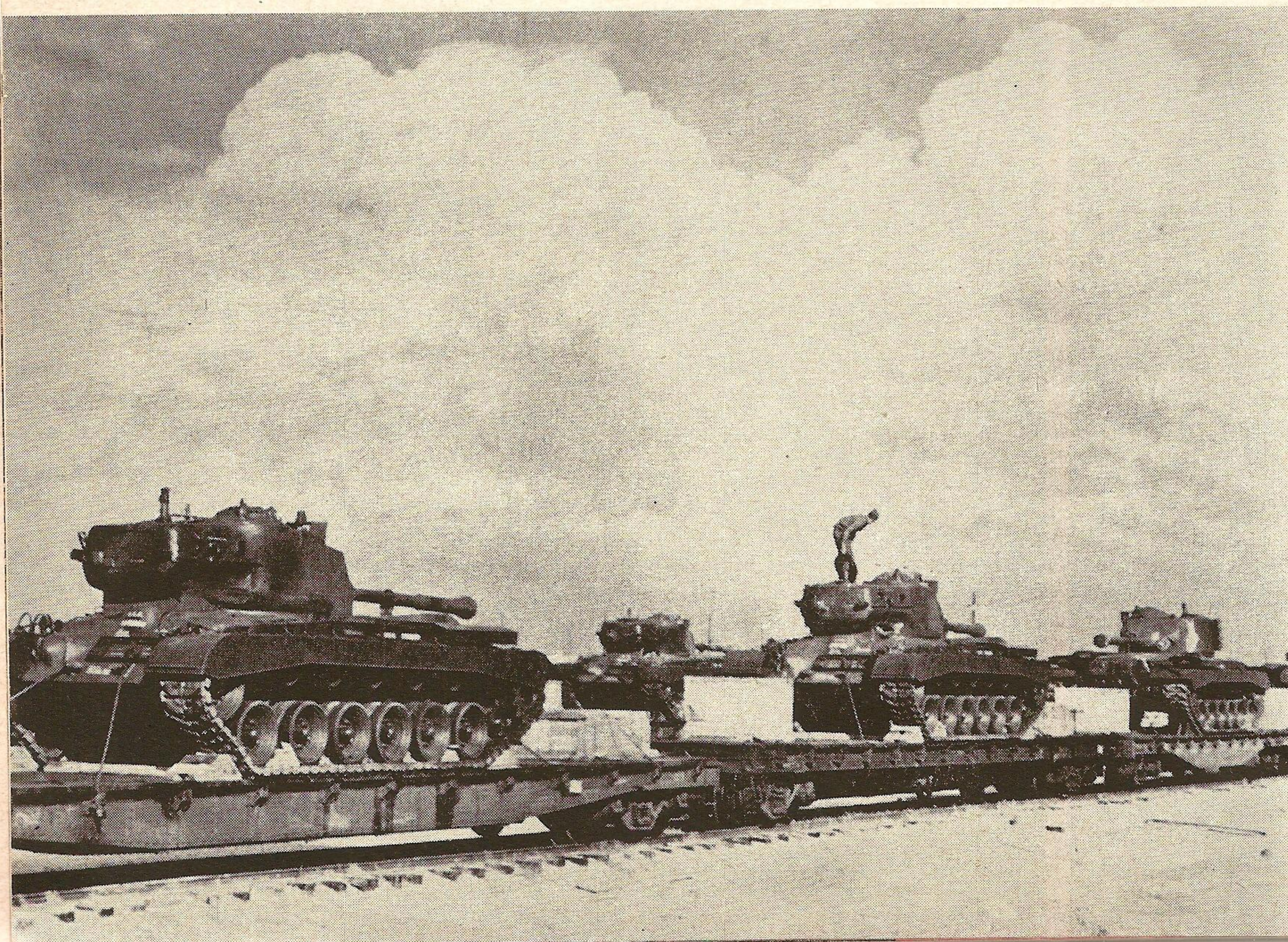
51 During World War II, the railroads handled 97 per cent of all organized military travel. They carried millions of soldiers, sailors, marines, and coast guardsmen to and from training centers and seaports. They carried millions of members of the armed forces on trips to and from their homes and recreational areas. They also operated numerous hospital trains carrying wounded servicemen and many other trains carrying prisoners of war.

In peace, as in war, our government maintains an Army, a Navy, and an Air Force, and the railroads must be prepared at all times to carry military personnel and their equipment where and when needed.



SOLDIERS ON THE MOVE

SPEEDING MILITARY EQUIPMENT BY RAIL



52 In wartime, railroads are the vital life lines of the nation. Only the railroads are equipped to transport heavy war goods such as tanks, big guns, steel for battleships, engines, boilers, turbines, and many other things.

During World War II, railroads carried 90 per cent of all military freight. They delivered millions of carloads of materials and supplies to camps and bases. They brought raw materials to mills, arsenals, and manufacturing plants, and took the products of mills and factories and arsenals to military bases and to seaports for shipment overseas. This nation could not defend itself successfully without railroads.

53 Nearly every important factory or mill is located on a railroad. The railroad and the factory work together. Railroads bring fuel and raw materials to the factory and take the products of the factory to markets. To make one article—such as a bicycle, a sewing machine, or a radio—dozens of different materials are needed, and these may come from places many miles away. Often the parts are made in factories in different cities and assembled in a factory in still another city. Railway transportation makes this possible. Tracks usually run directly into a factory where cars can be loaded and unloaded conveniently.



FACTORIES ARE FED RAW MATERIALS BY TRAINS

RAILROAD MATERIAL YARD AND STOREHOUSE



54 Railroads buy thousands of different items — and these purchases are made in many cities and towns throughout the country. Railroads use fuel, tools, and machines. They use iron and steel products, forest products, and a wide variety of manufactured products. The railroad storehouse resembles a big hardware store where everything is neatly kept on shelves, as seen in the right-hand picture.

Storage yards are used to keep the big, bulky things such as rails, pipes, springs, and wheels. The left-hand picture shows how these supplies are kept outside in neatly stacked piles.

55

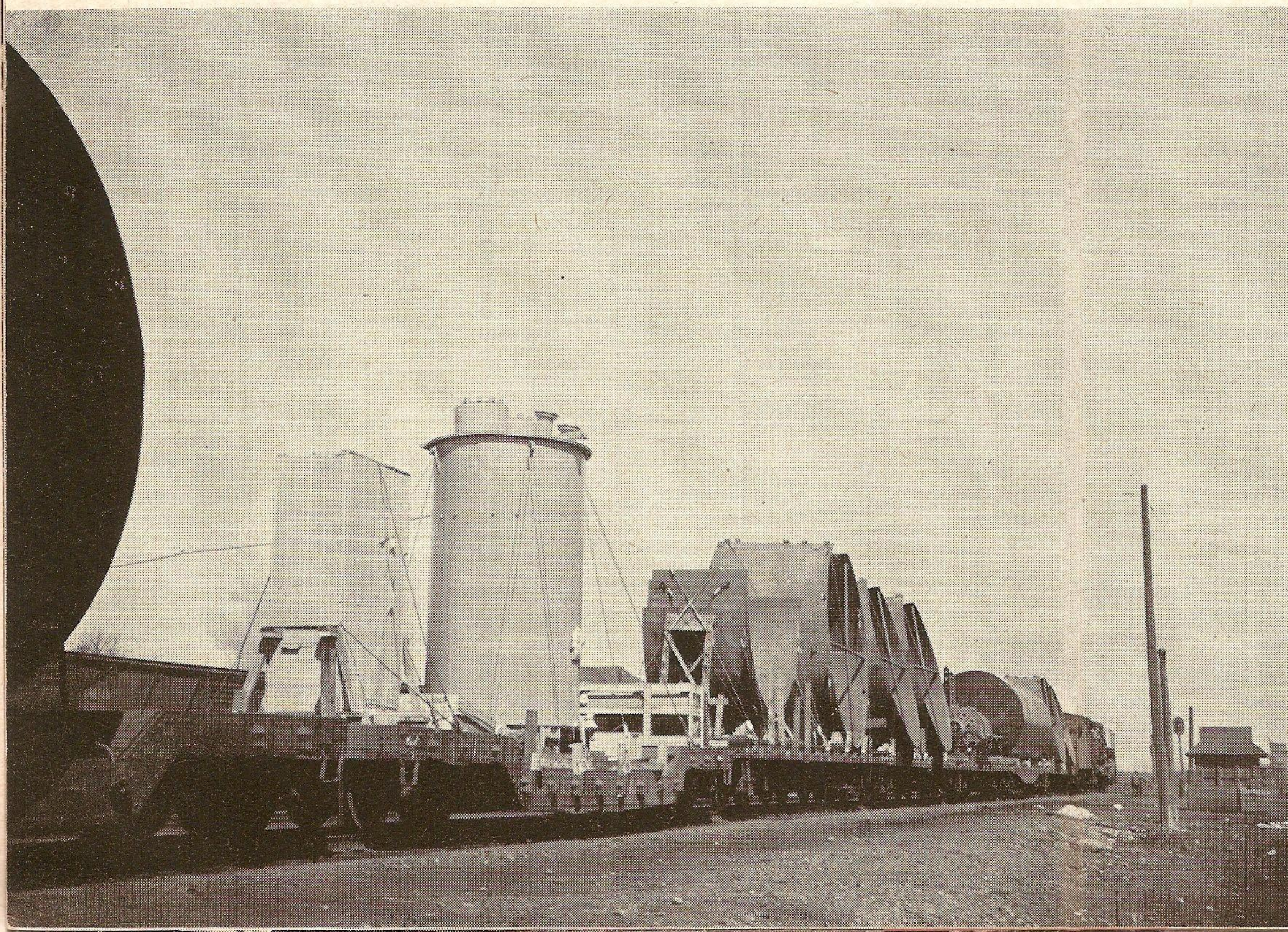
The larger the railroad, the more offices it will have. The main office handles the work of the president and other executive officers. In addition, each railroad has offices scattered in cities and towns along its line. Some railroads have traffic offices in cities not on their lines, to sell tickets and route freight shipments.

Every railroad has much office work to do. For example, the top picture shows employees sorting waybills in a filing "wheel." The papers for any freight shipment can be found, quickly and easily. Below, carload traffic records are kept in the card tray filing system. The trays are on rollers and can be moved to the operators.

IN A RAILROAD OFFICE



RAILROADS CARRY "ANYTHING, ANY TIME"

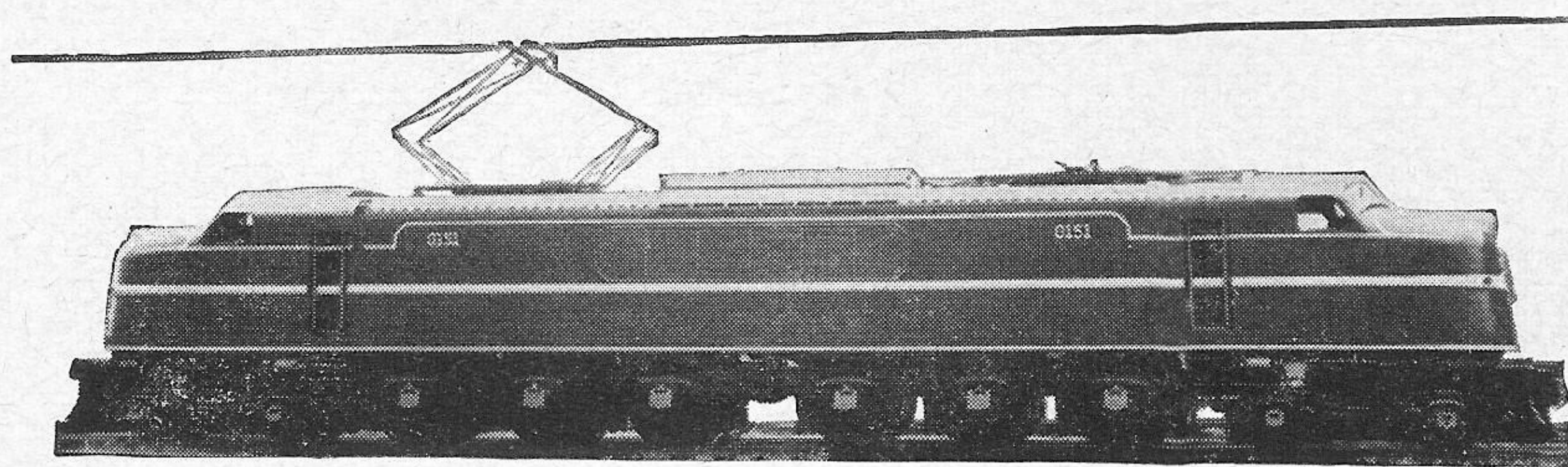


56

The picture shows some of the extra-large and heavy shipments carried by railroads. Railroads are equipped to handle every kind of shipment—big or little—from bobby pins to battleship turbines. The heaviest freight shipment carried to date weighed 673,000 pounds. The tallest shipment stood 28 feet above the rails. Railroads have carried single shipments up to 183 feet in length.

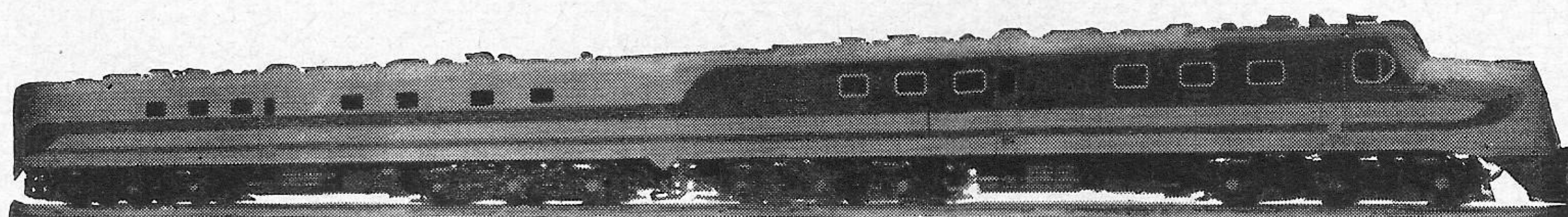
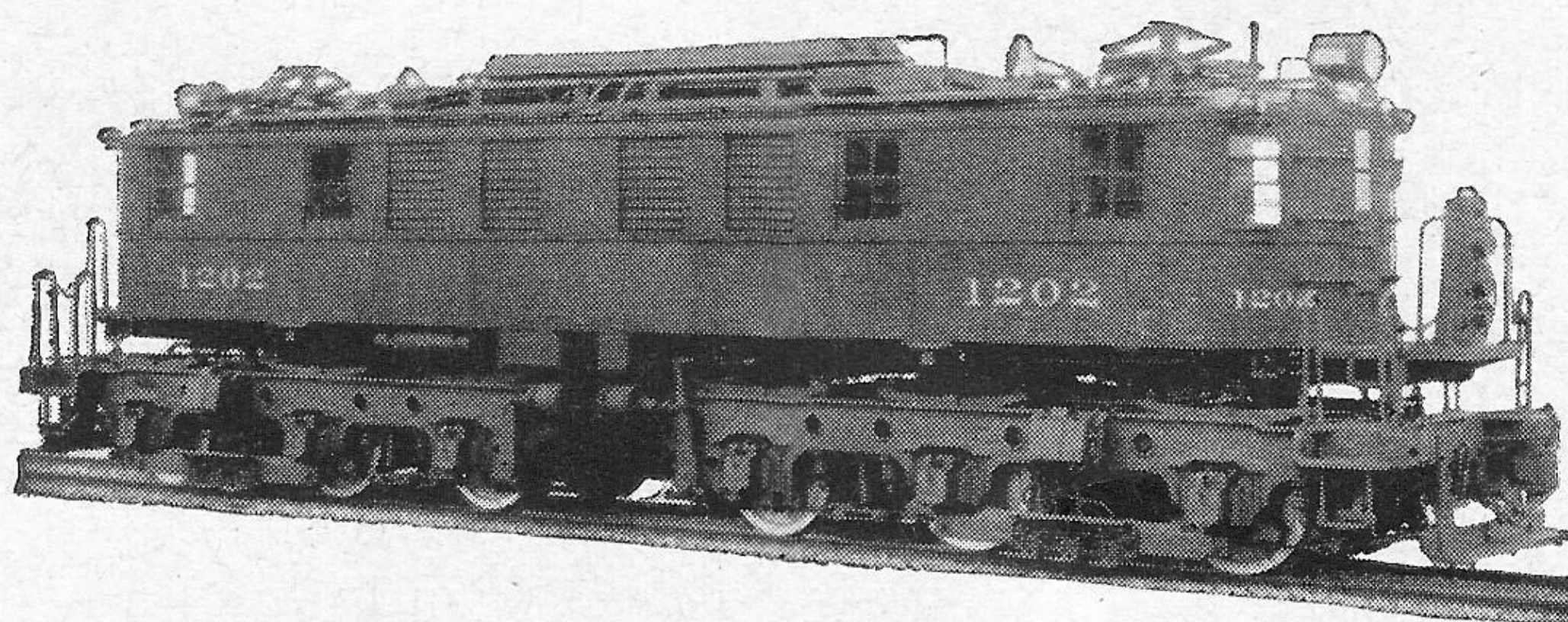
Among the many big shipments moved by train are engines and turbines, giant guns for the Army and Navy, and generators. Heavy machinery for mines, automobile factories, steel mills, and other plants is regularly handled by railroads.

ELECTRIC AND DIESEL-ELECTRIC LOCOMOTIVES

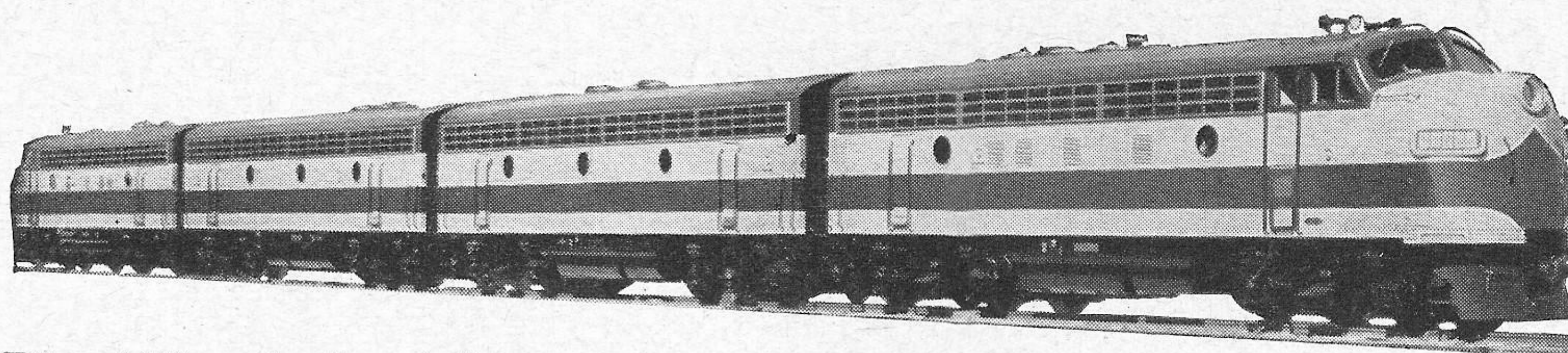


Electric
Locomotive
(2C+C2)

Electric
Locomotive
(C+C)

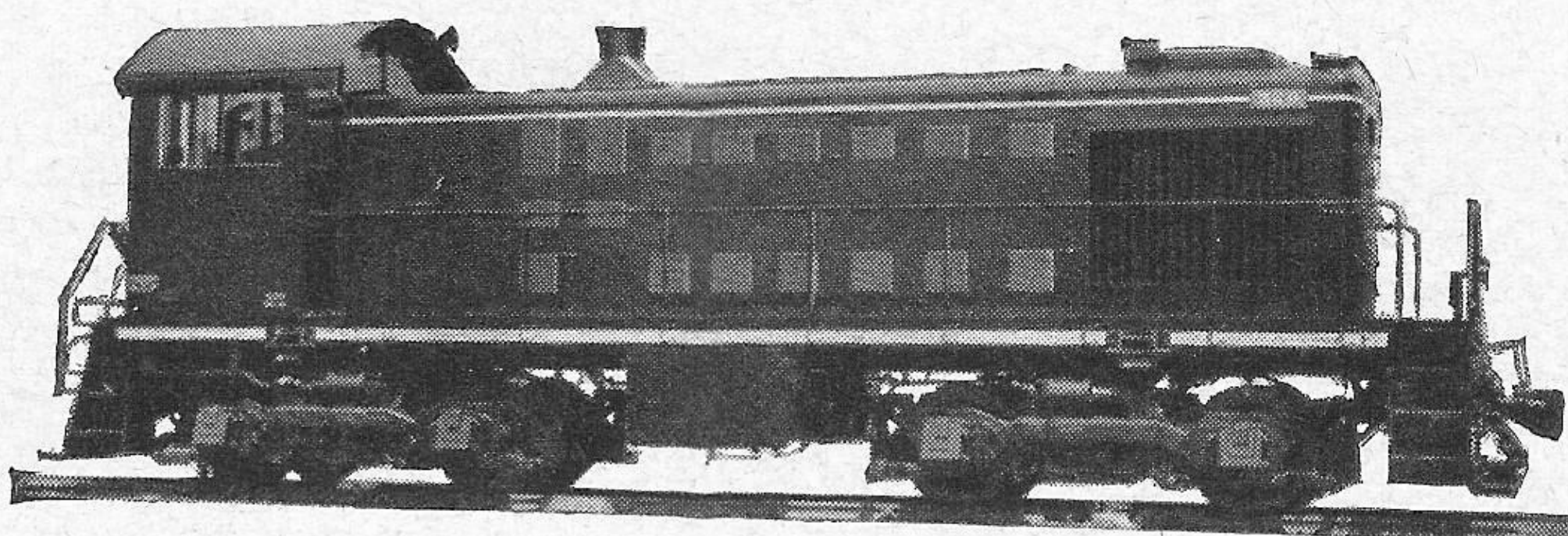


Diesel-Electric Road Locomotive

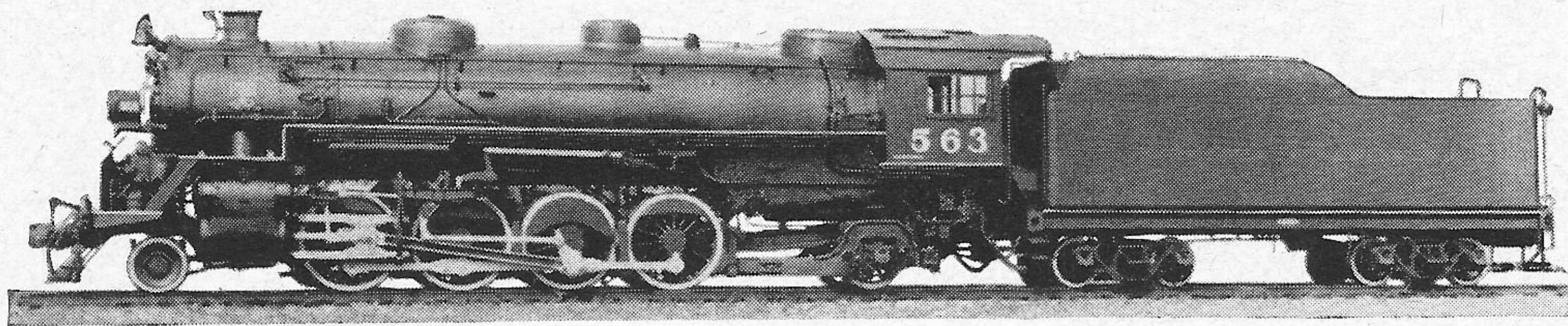


Diesel-Electric Road Locomotive

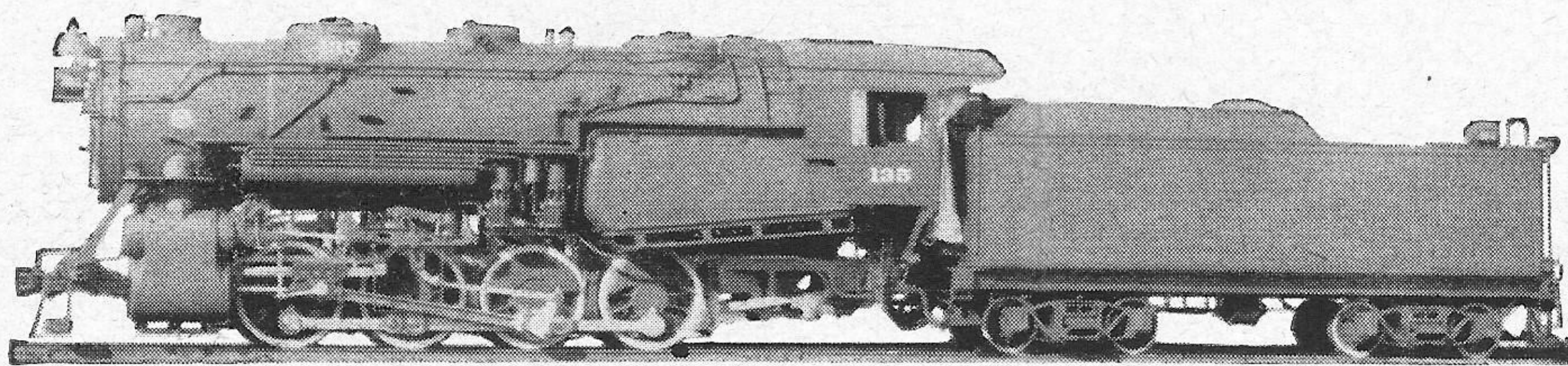
Diesel-
Electric
Switching
Locomotive



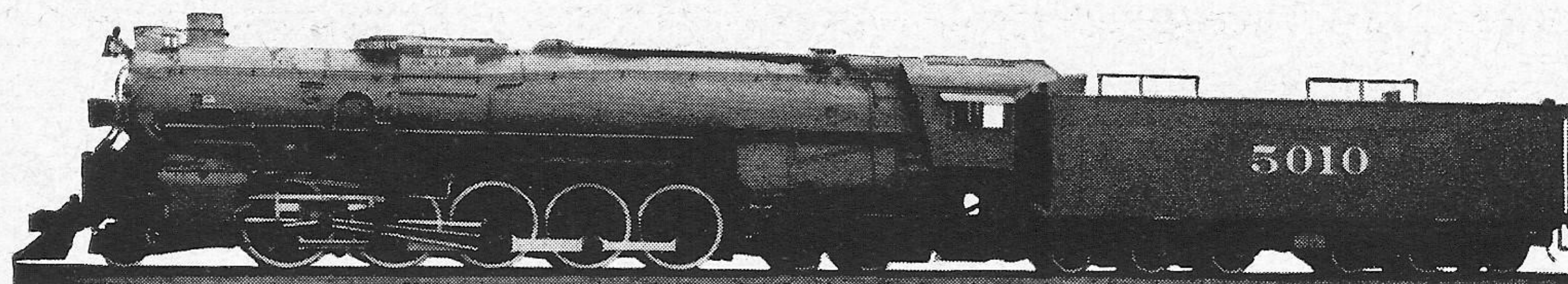
STEAM FREIGHT LOCOMOTIVES



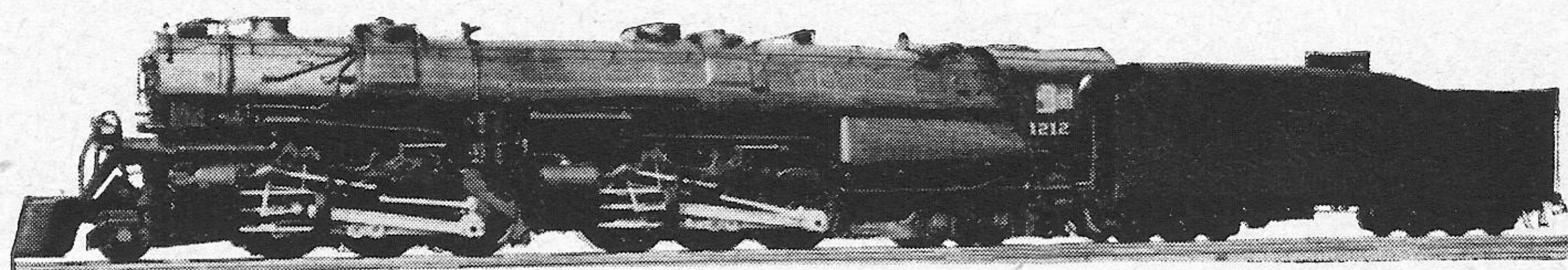
2-8-2 (Mikado)



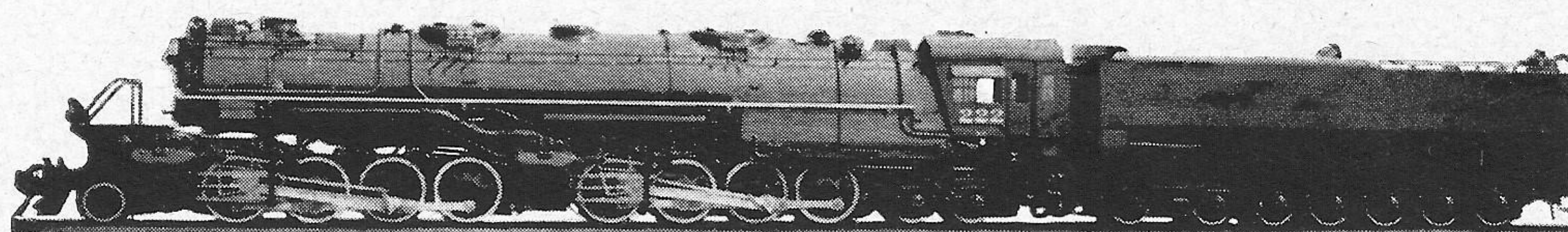
0-8-0 (Eight-wheel Switcher)



2-10-4 (Texas)

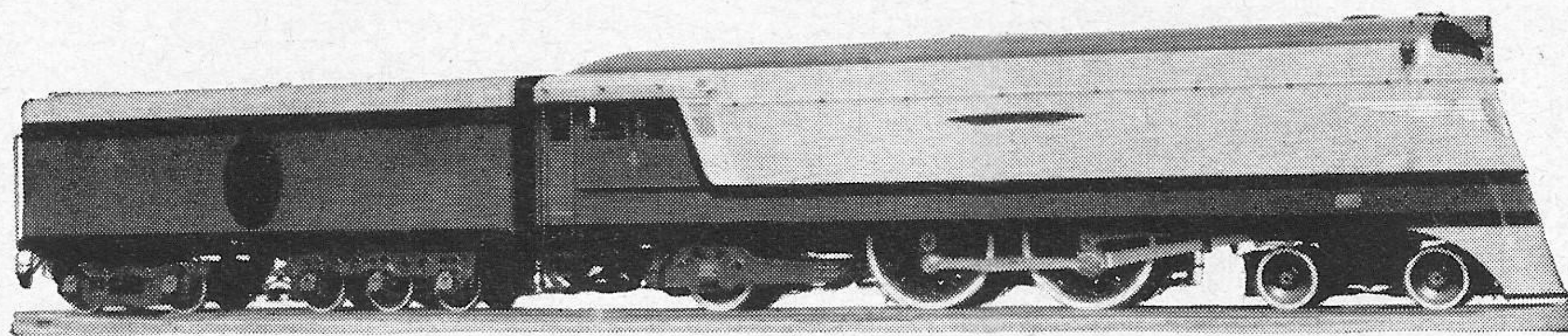


2-6-6-4 (Mallet: Articulated)

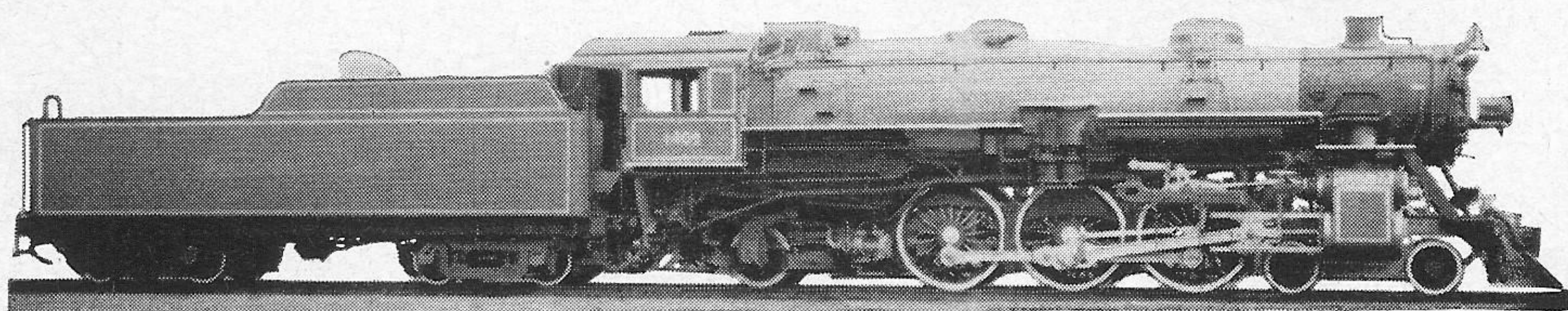


2-8-8-4 (Yellowstone)

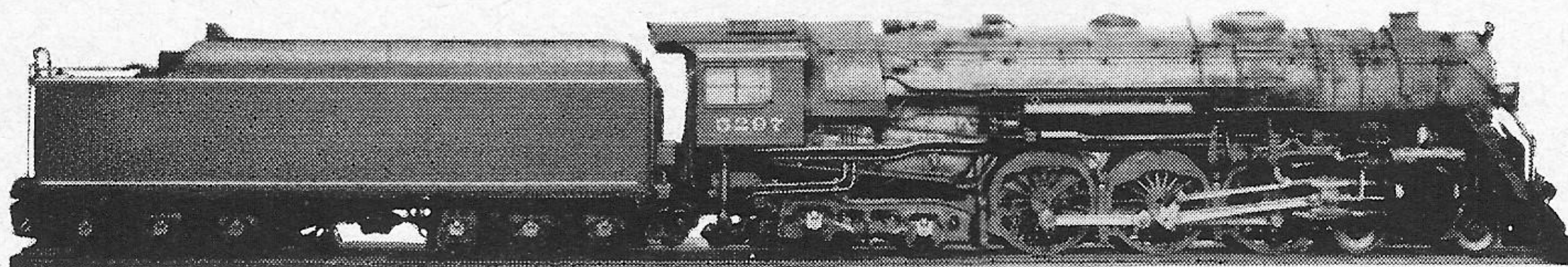
STEAM PASSENGER LOCOMOTIVES



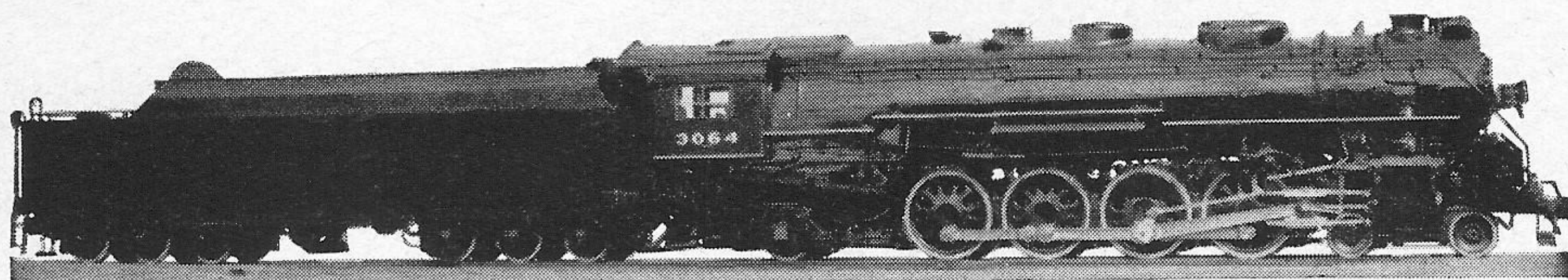
4-4-2 (Atlantic)



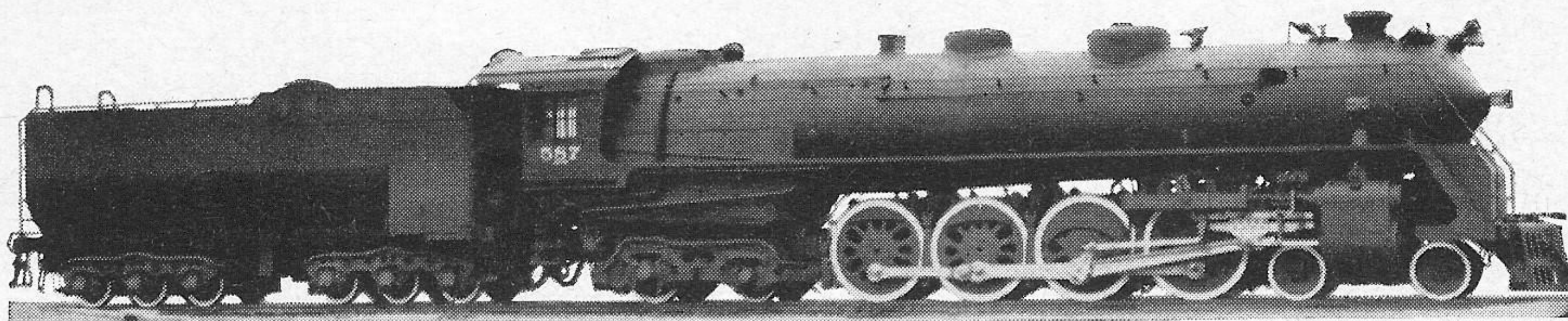
4-6-2 (Pacific)



4-6-4 (Hudson)

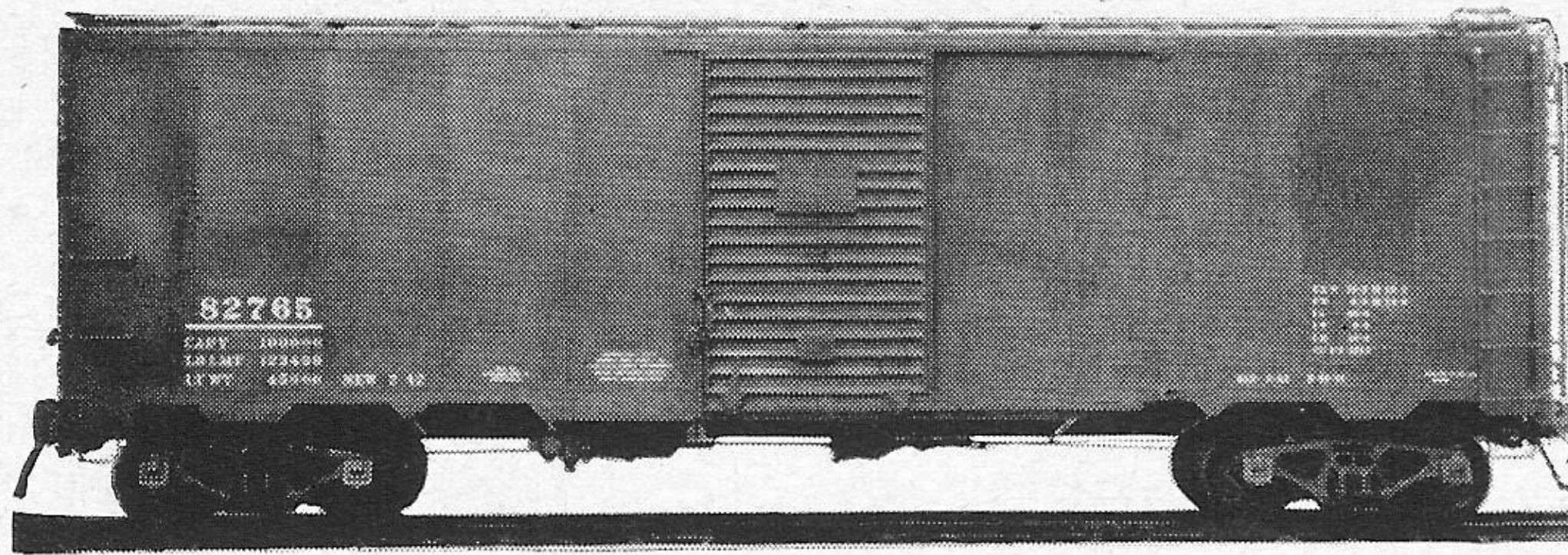


4-8-2 (Mountain)



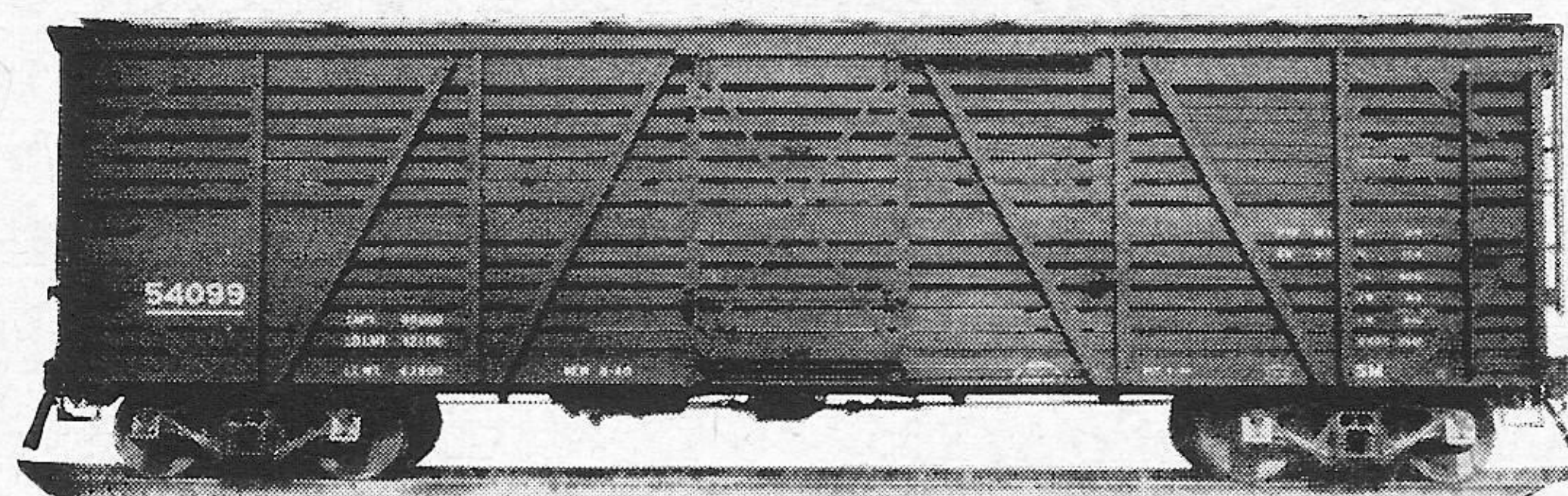
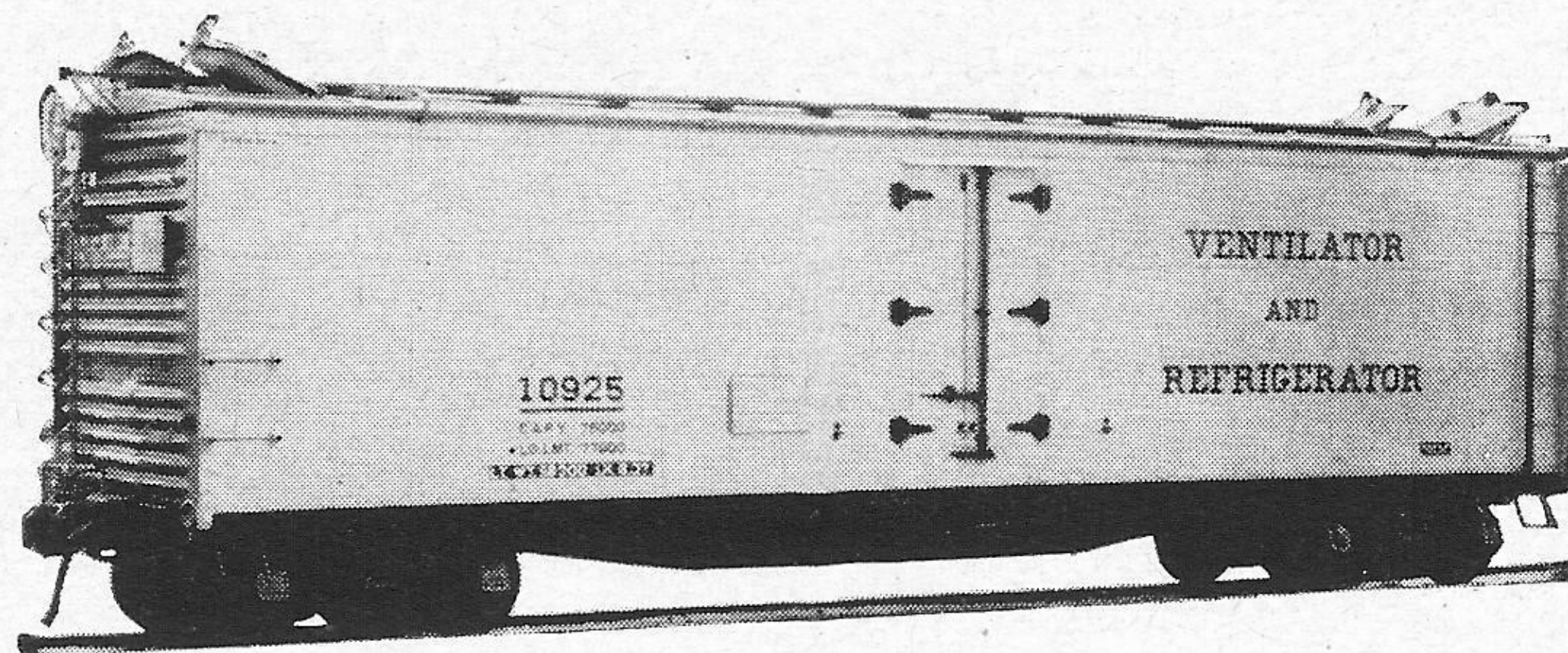
4-8-4 (Northern)

FREIGHT TRAIN CARS



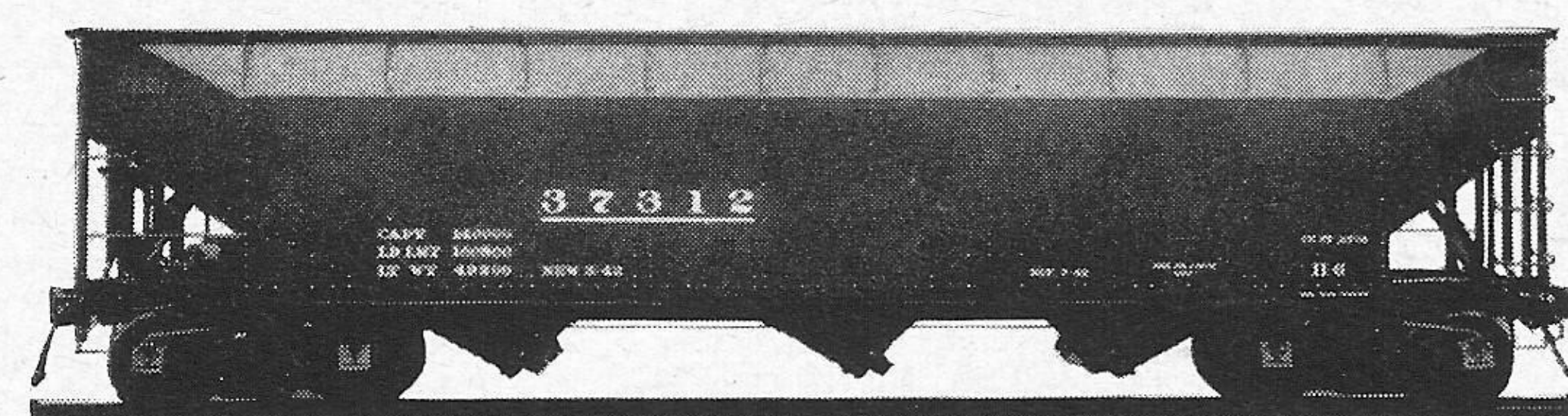
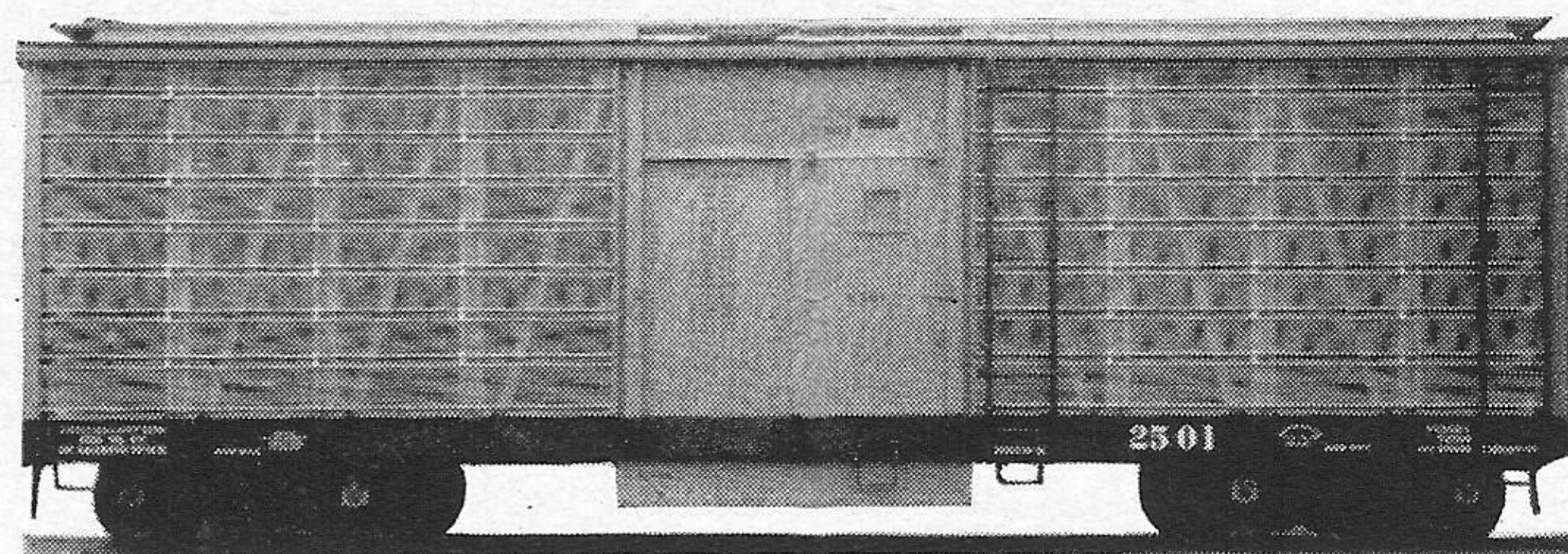
Box
Car

Refrigerator
Car



Stock
Car

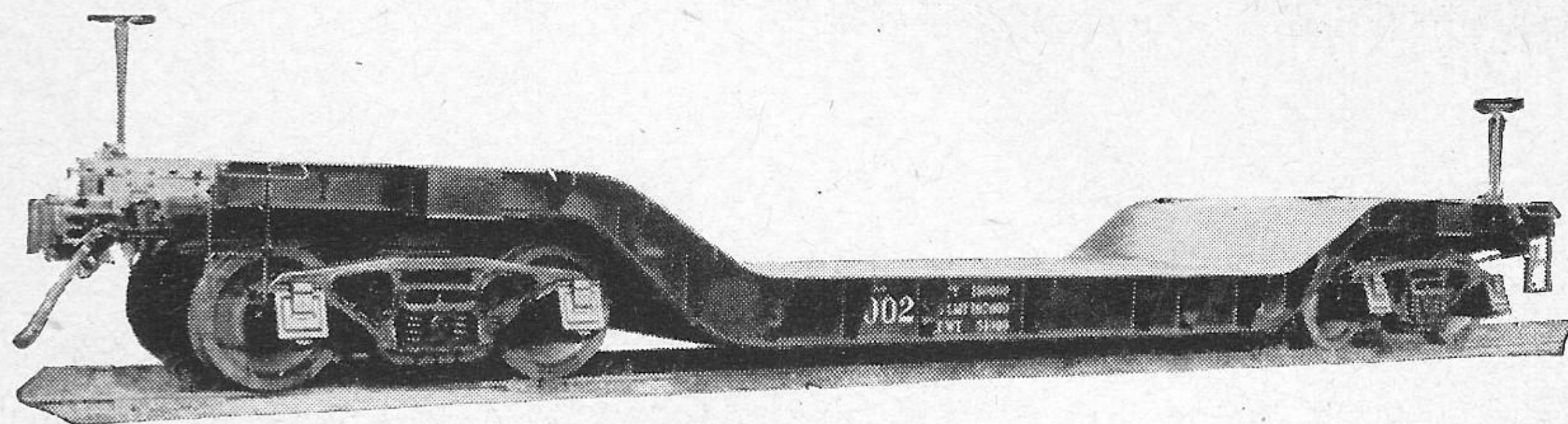
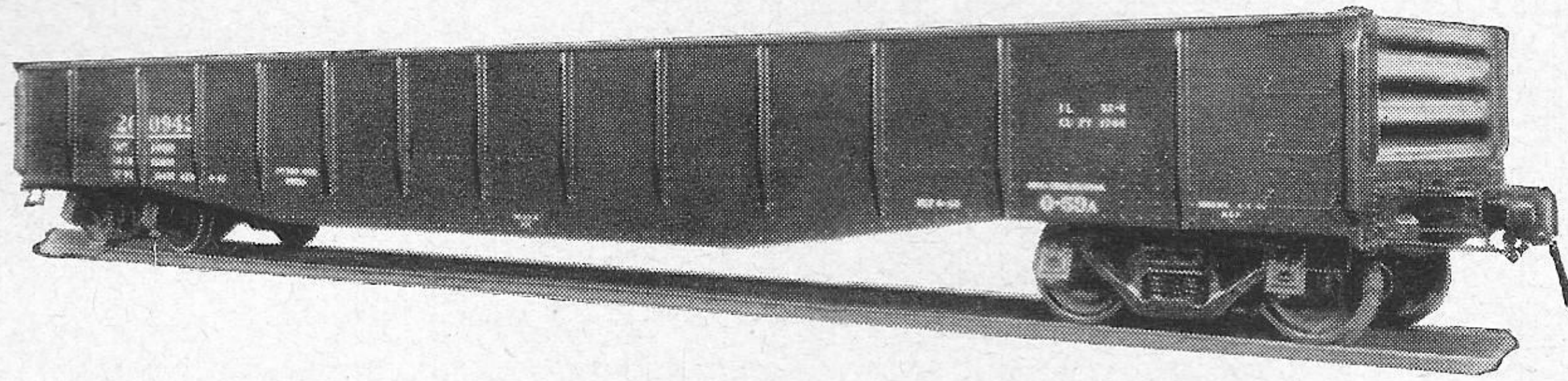
Poultry
Car



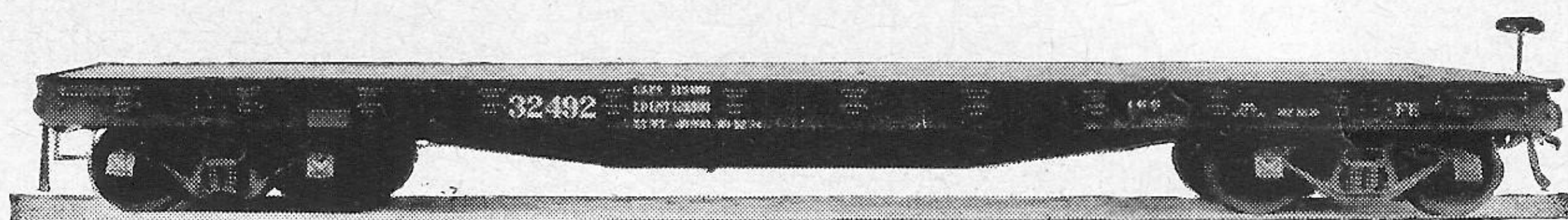
Hopper
Car

FREIGHT TRAIN CARS

Gondola
Car

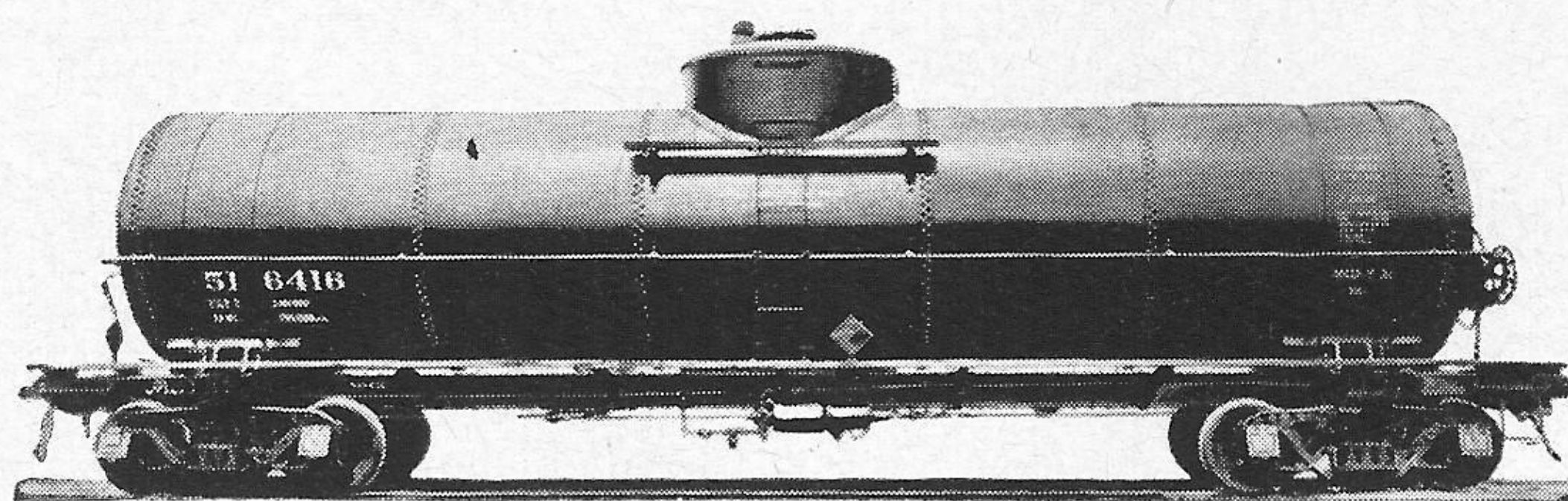
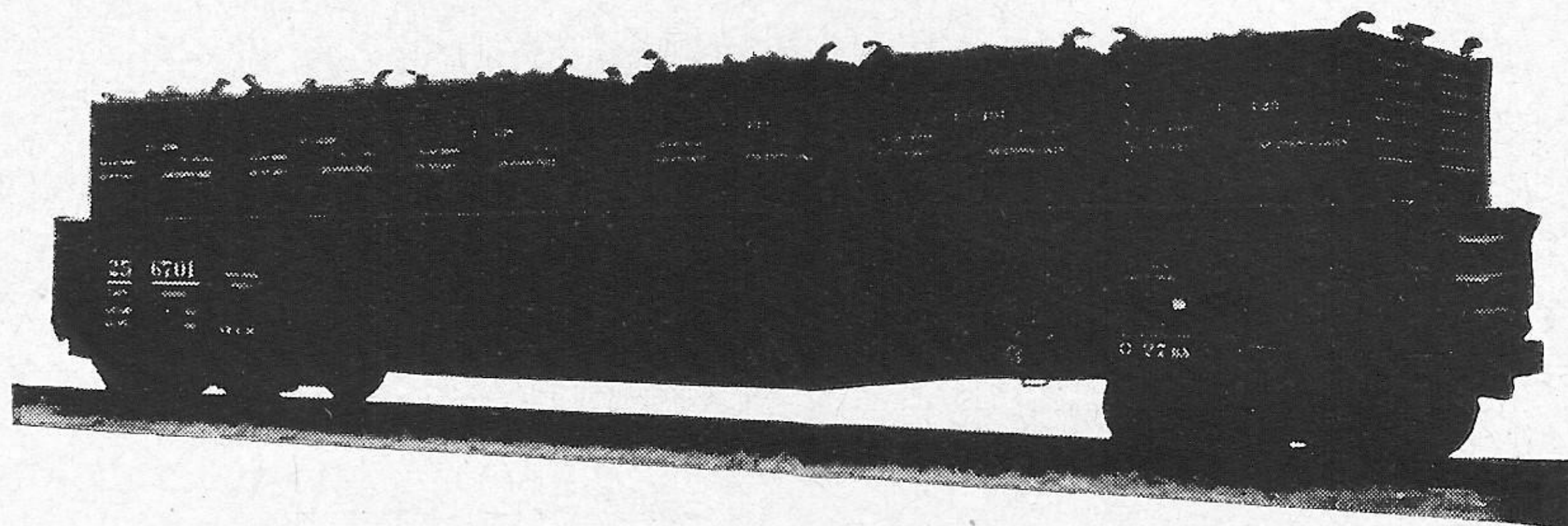


Depressed-
Center
Flat Car



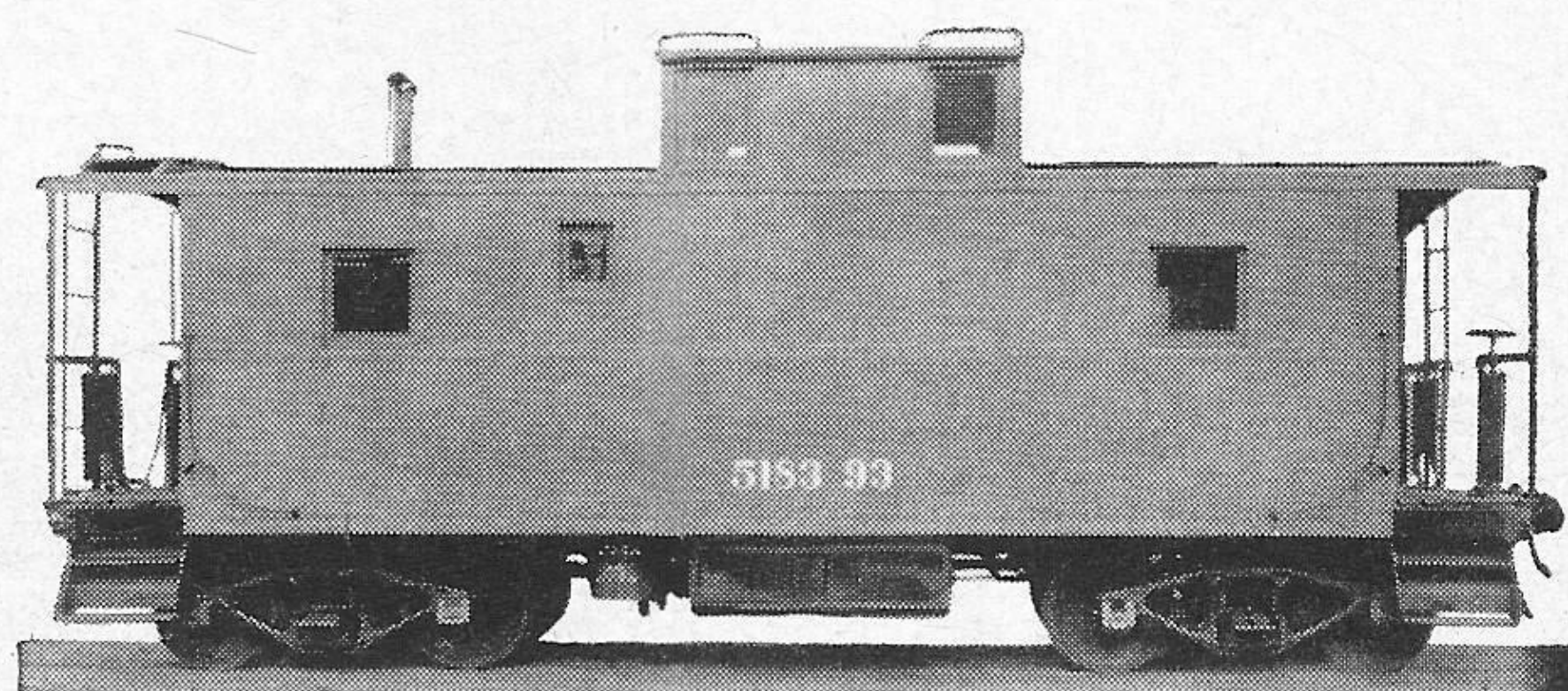
Flat
Car

Container
Car

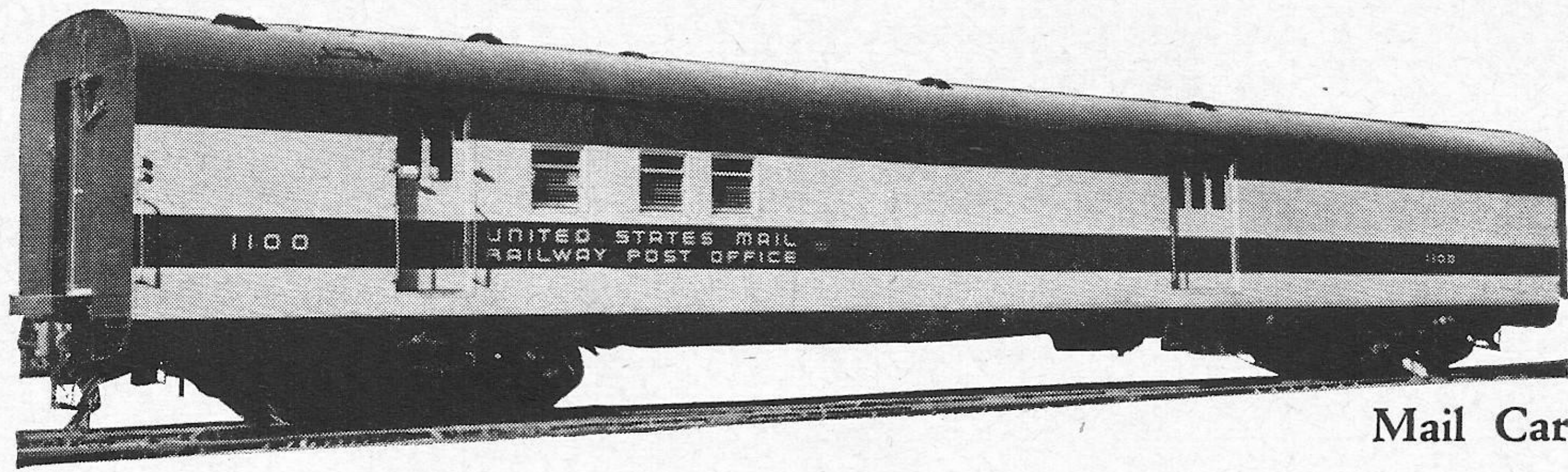


Tank
Car

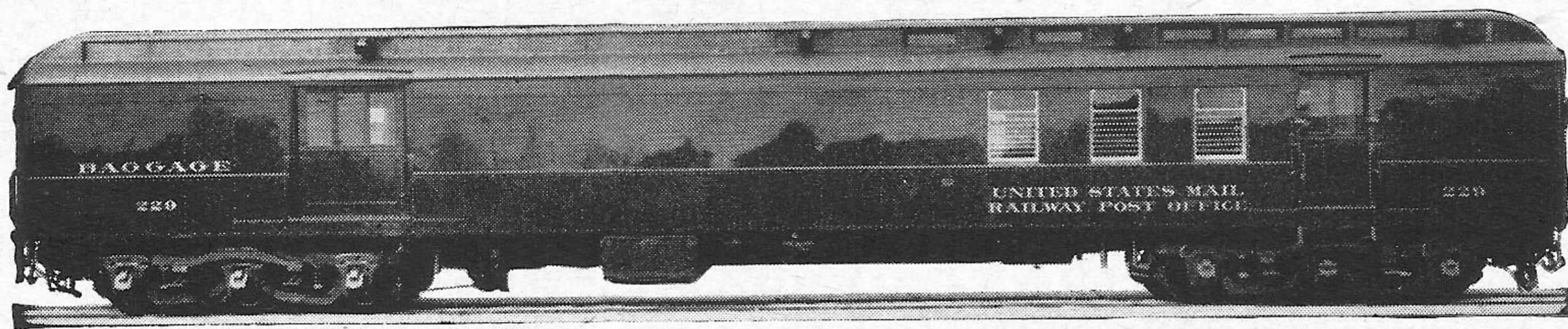
Caboose



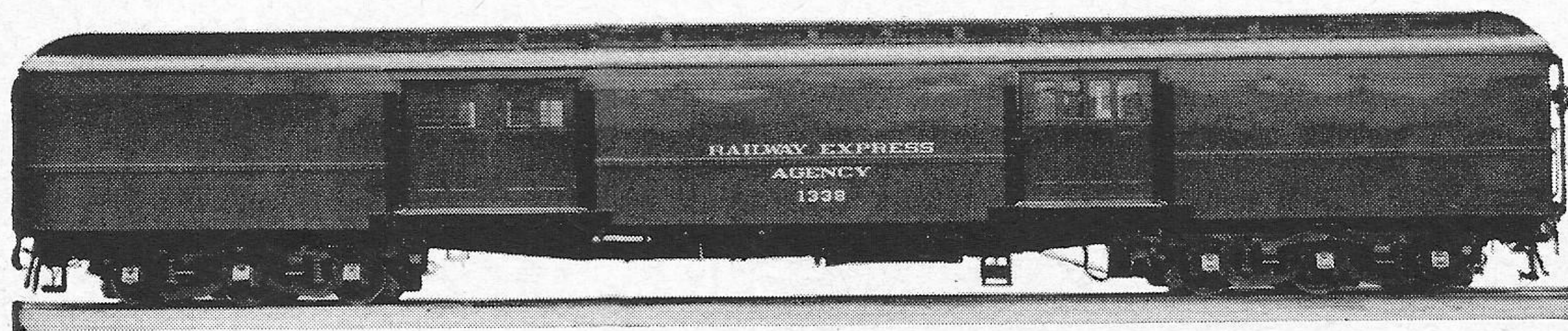
PASSENGER TRAIN CARS



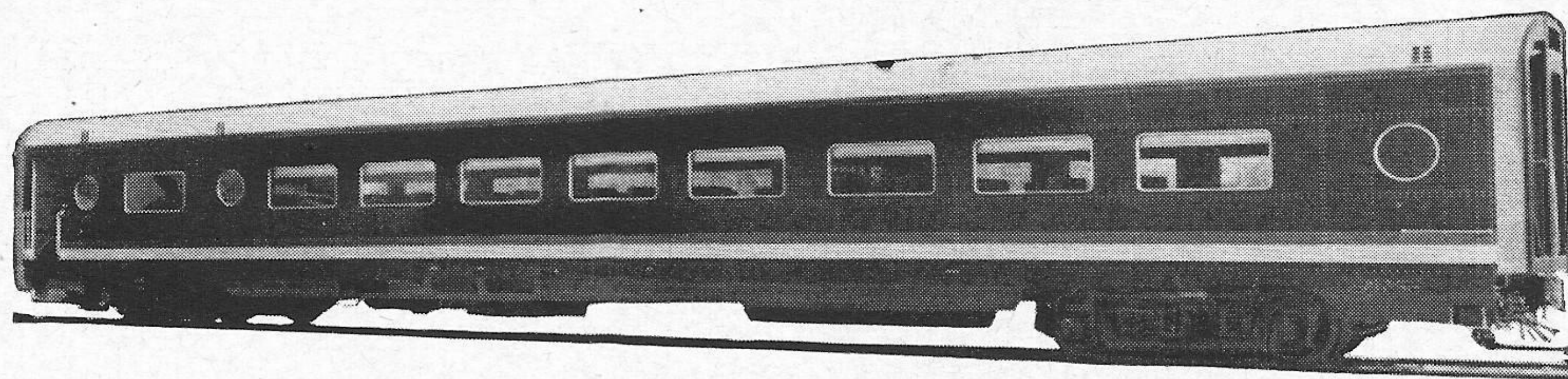
Mail Car



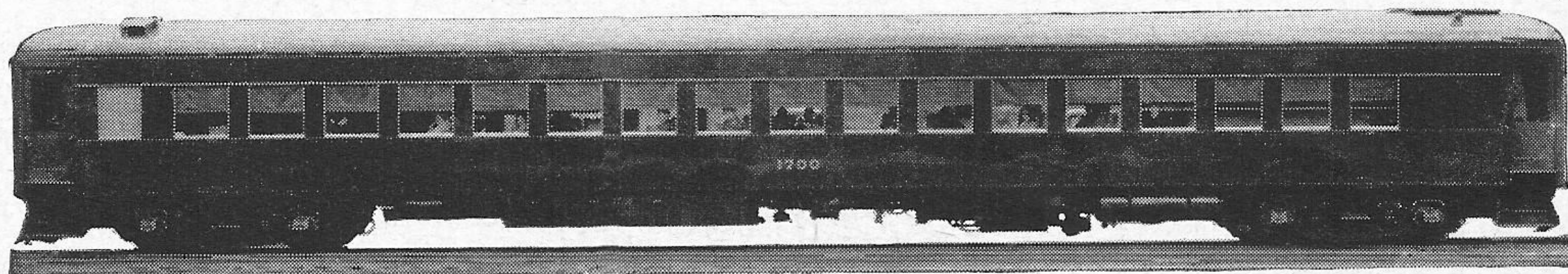
Baggage and Mail Car



Express Car

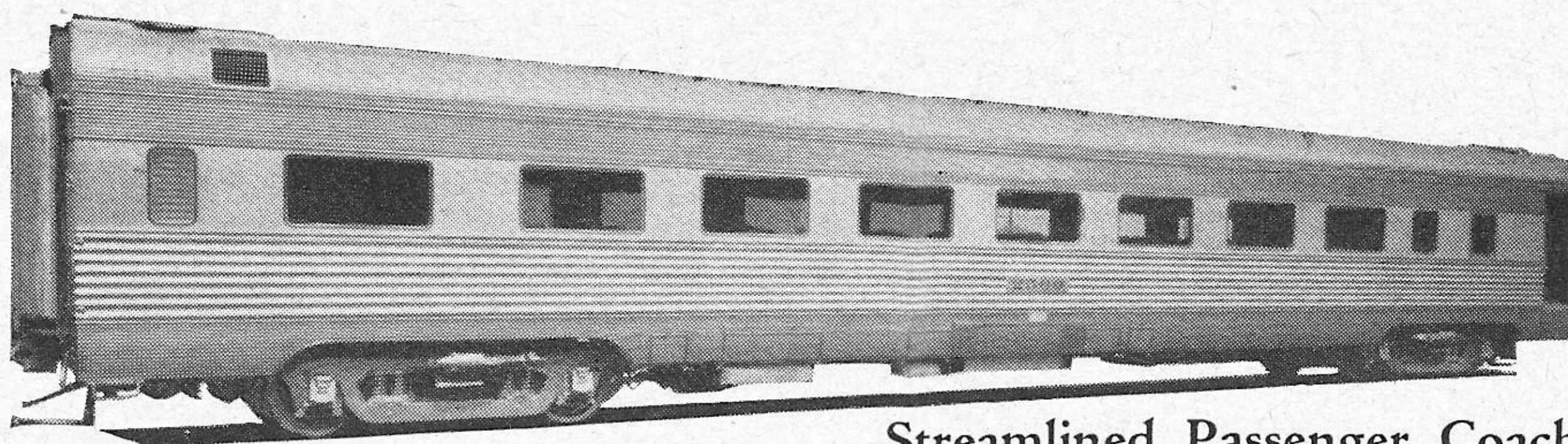


Passenger Coach

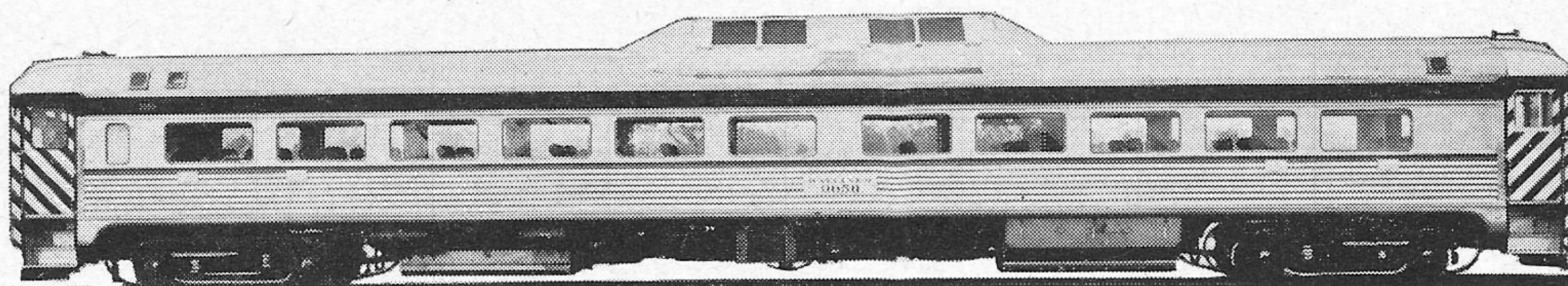


Passenger Coach

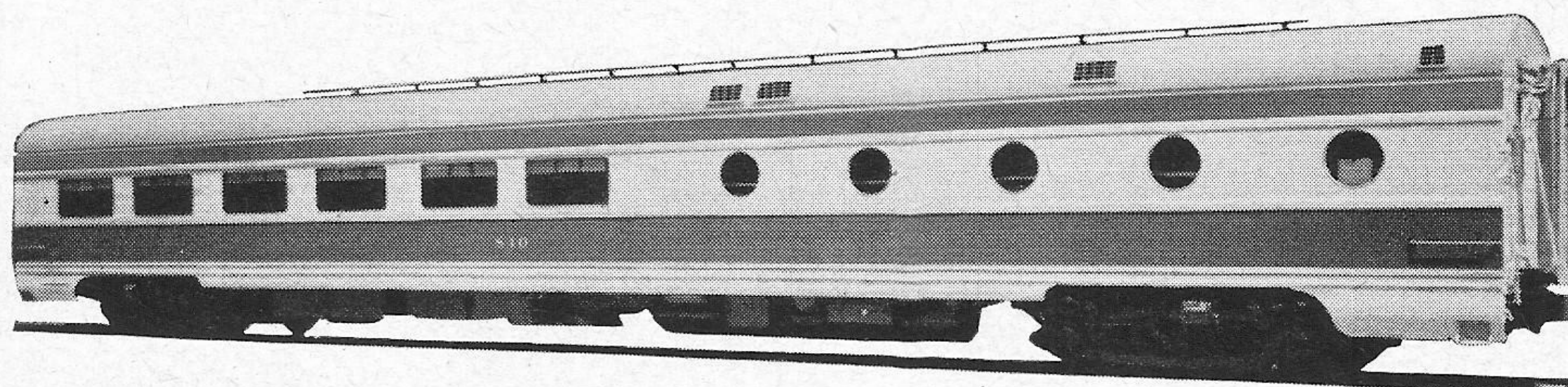
PASSENGER TRAIN CARS



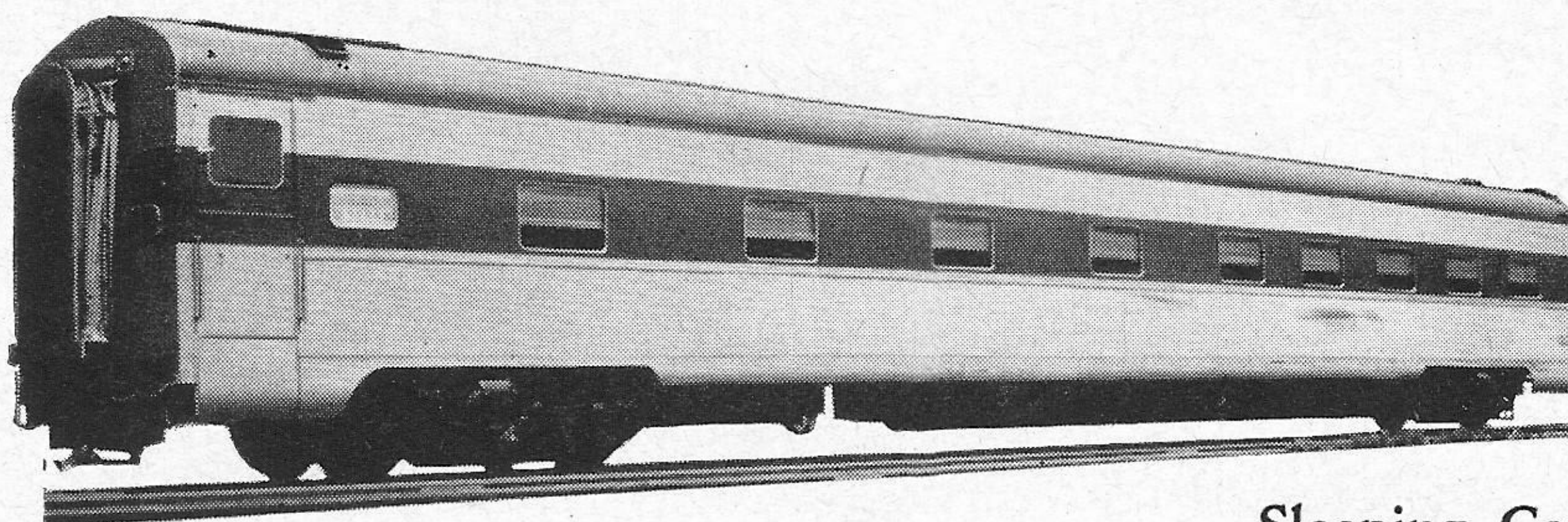
Streamlined Passenger Coach



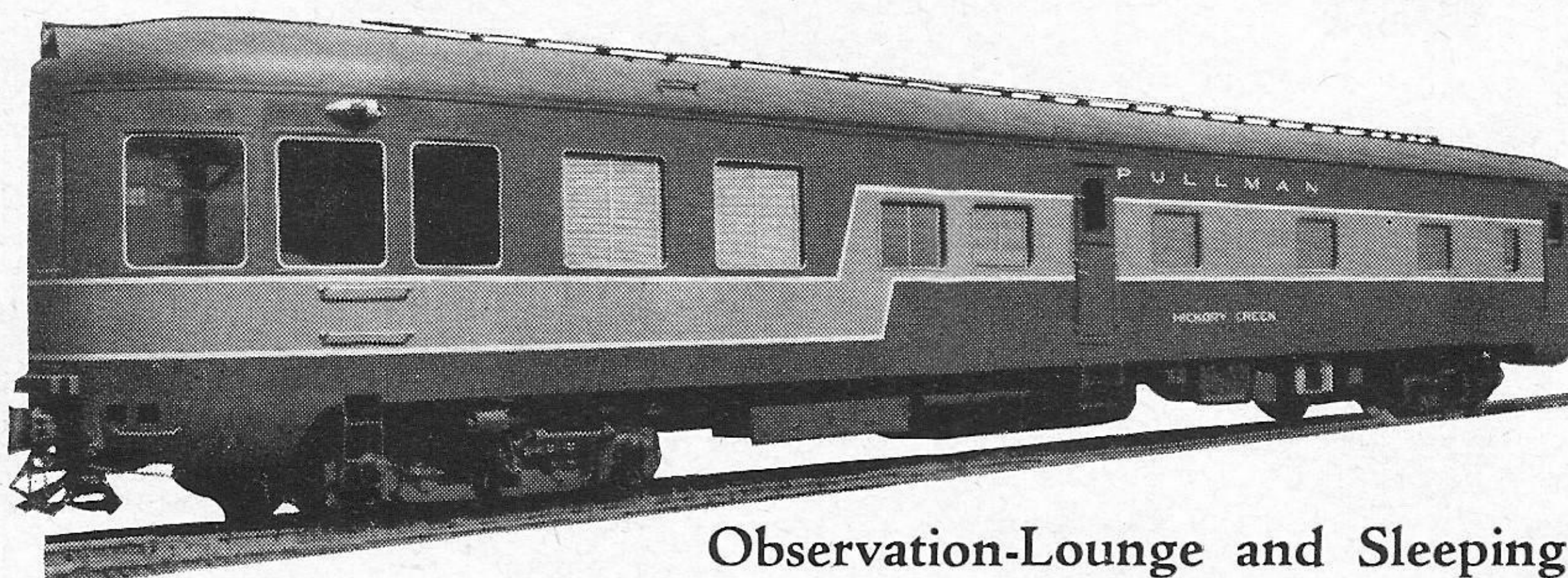
Rail Diesel Car



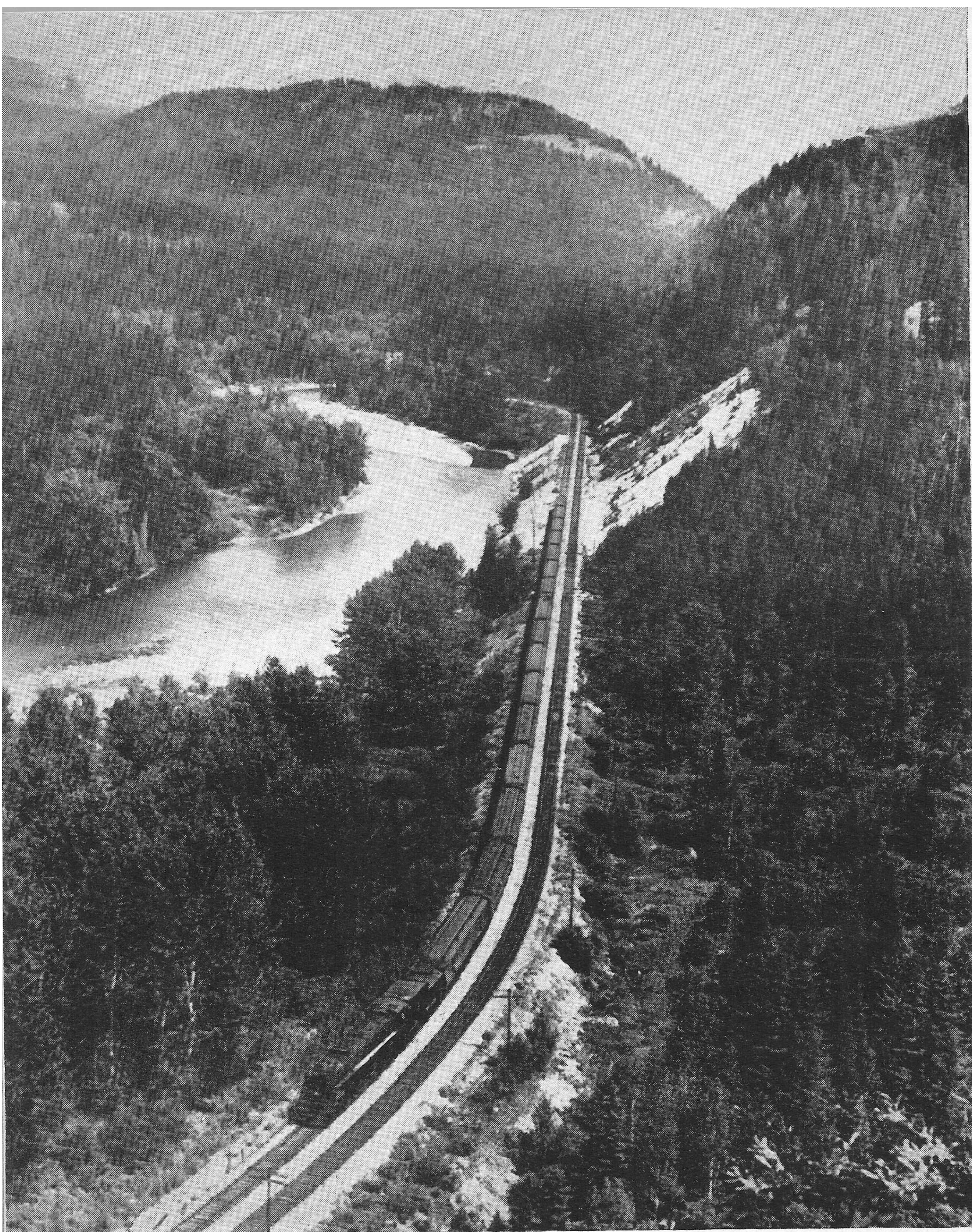
Dining Car



Sleeping Car



Observation-Lounge and Sleeping Car



The Railroads

For more than a century, Americans young and old have been fascinated by the excitement and glamor that are part of the railroad tradition—the power of locomotives, the pleasant thrill and sense of adventure inspired by the sound of a train whistle in the distance, the sight of endless rails stretching to the horizon, the mystery of far-off places.

This romance of railroad-ing and, in late years, an increased awareness of the essential nature of railroads, have stimulated a tremendous interest in railroad history, equipment, organization, services, operations, and so on. Teachers may obtain railroad information by writing the office indicated below.

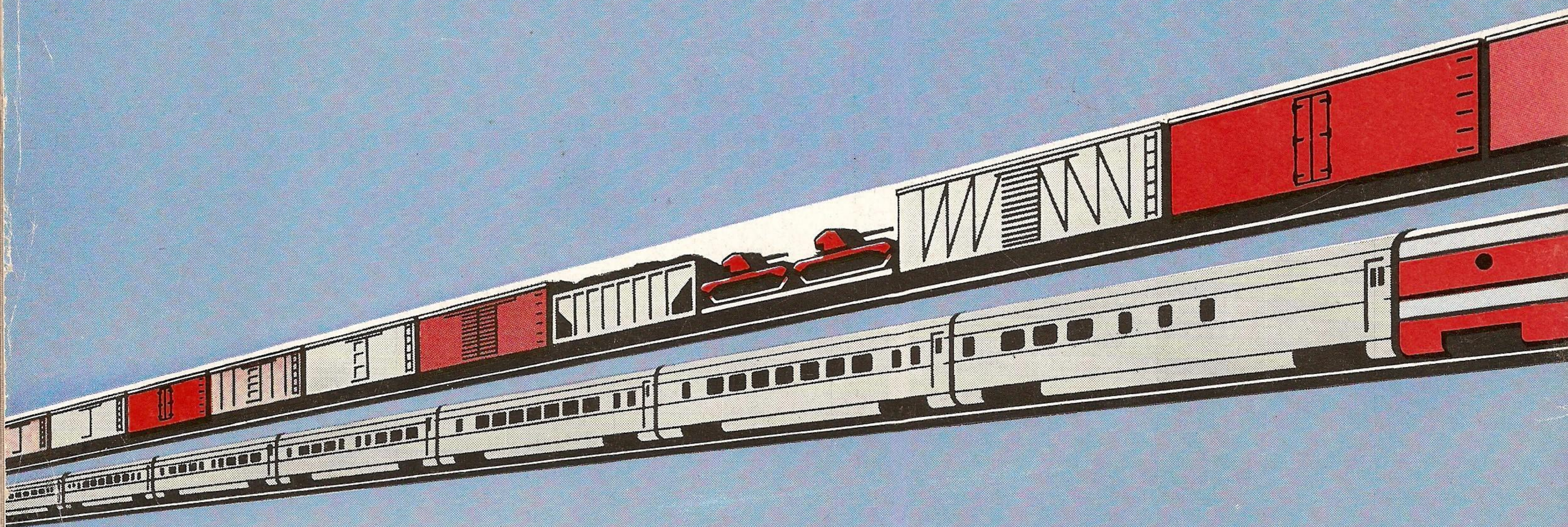
School and College Service

ASSOCIATION OF AMERICAN RAILROADS

Transportation Building

Washington 6, D. C.





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